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Electric Heat Treatment of Gun Forgings

Installation at Naval Gun Plant of Tioga Steel & Iron Co., Philadelphia, Will Be Used for Commercial Work

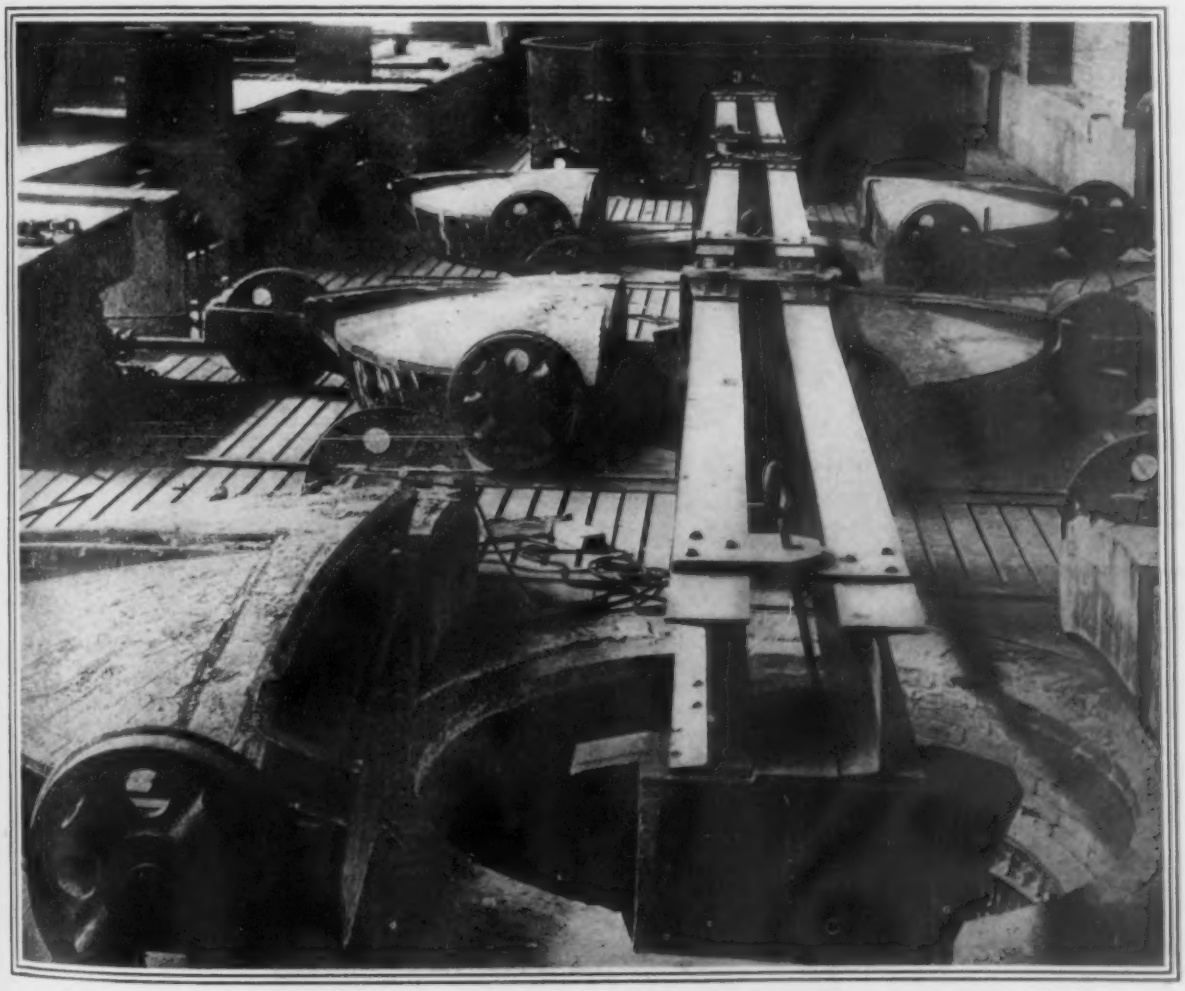
BY C. E. WRIGHT

ELECTRIC heat treatment of gun forgings is a development of the war period. Only a few of the new gun plants installed electric heat treating furnaces, one of these being the plant built especially for naval guns by the Tioga Steel & Iron Co., Philadelphia, where the success of this method of heat treating has assured its future importance in the manufacture of the general run of large commercial forgings.

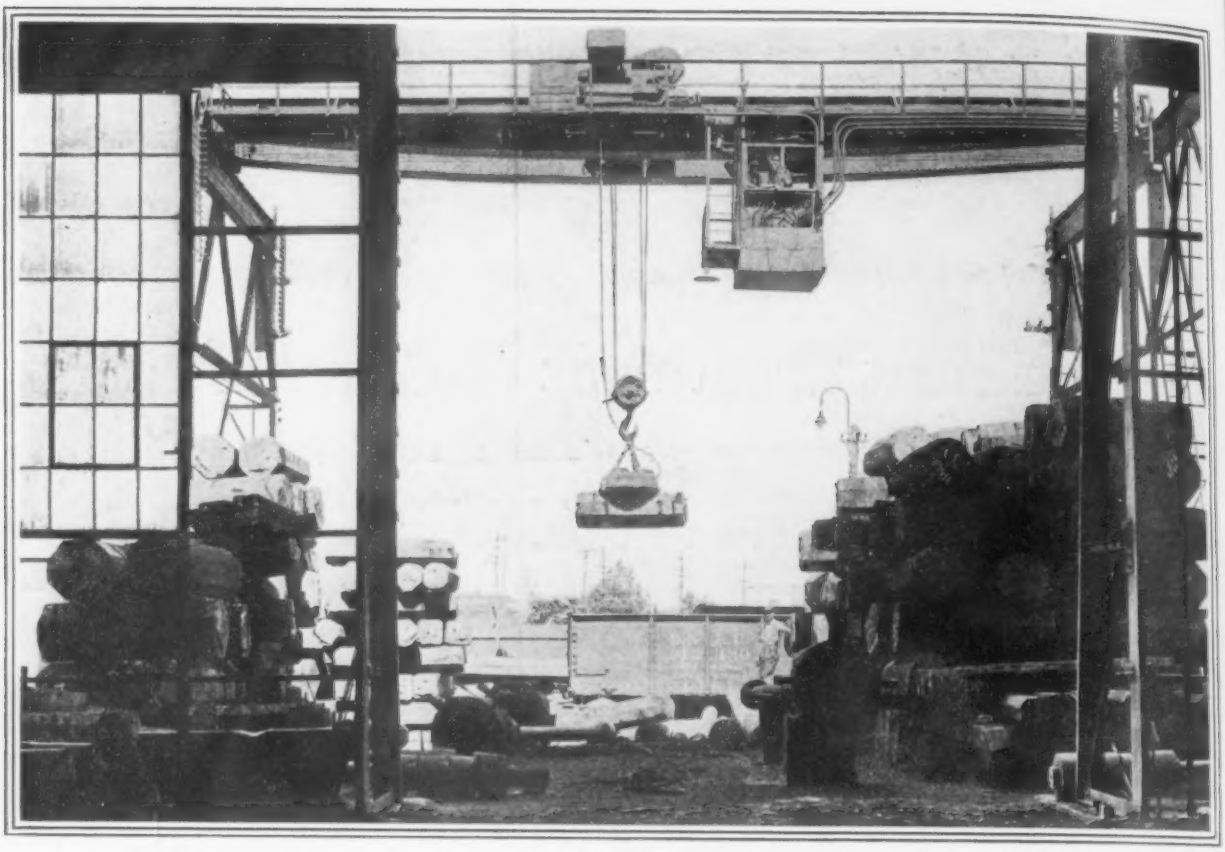
Some of the emergency gun plants preferred to cling to the older methods of heat treating, but the War Department installed electric plants at one or two of the arsenals, and the Navy Department authorized their use at several of the private plants which were built to make 4 and 5-in. naval guns.

The Tioga company put in four vertical furnaces which were built by the General Electric Co. These furnaces are 22 ft. 11 in. deep and 6 ft. inside diameter in the clear and take 400 kw. of three-phase 440-volt current. Each furnace is divided into four sections and each section is independently controlled; that is, the current is automatically thrown off and on as the temperature rises above or falls below the proper point.

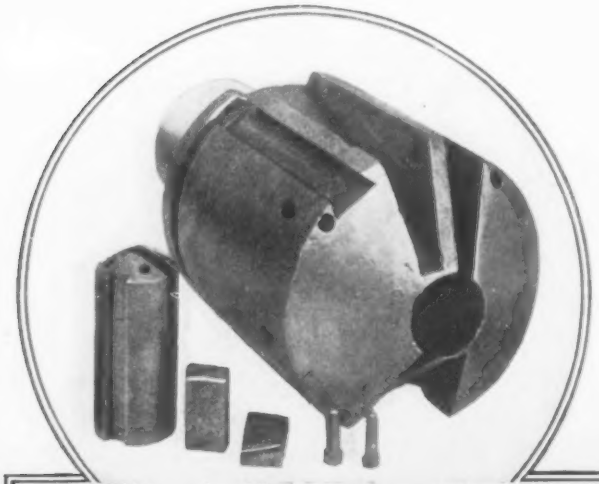
Two of these furnaces are used for heating the



The Pit Containing the Electric Heat Treating Furnaces and the Quenching Tank. There are four heat treating furnaces, the heat being automatically controlled. Two furnaces are used for heating the furnaces before quenching and two for drawing



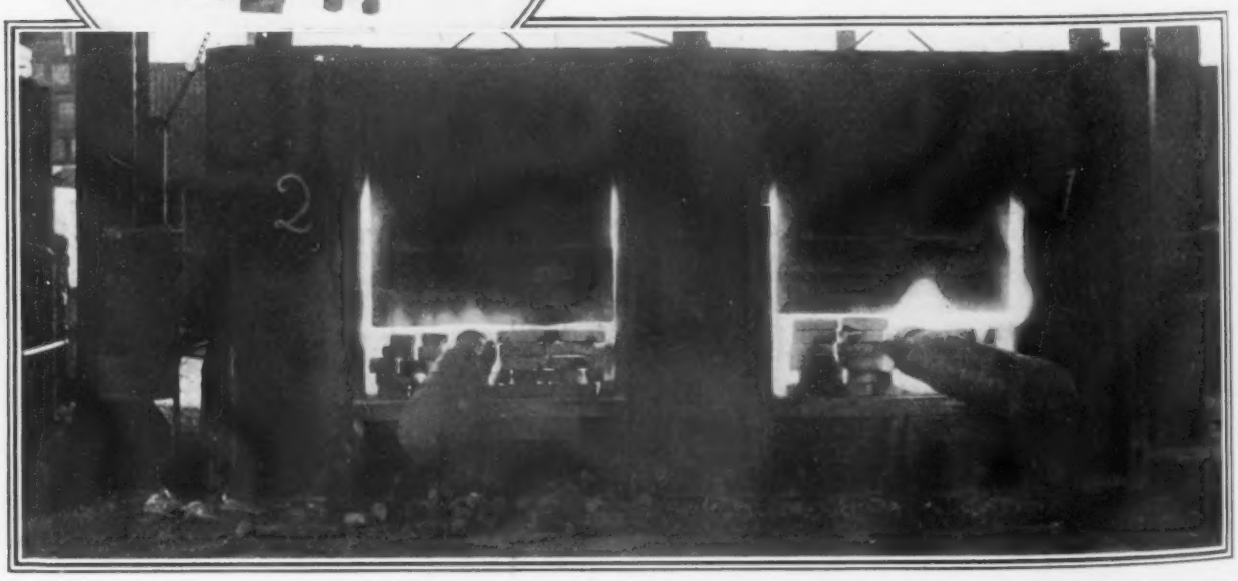
Ingots and Billets Are Carried from the Outside Storage Yard to the Furnaces by a 15-Ton Crane, Which Is Equipped with a Magnet and Magnet Cable Winding Drum



guns before quenching and two for drawing. The heaviest charge that has been treated in the Tioga plant consists of four 4-in. jackets, which with the holding gear, weigh 14 tons, and the lightest charge consists of six 4-in. tubes, which, with the gear, weigh 11 tons.

The jackets take about 10 hr. to heat and use 3000 kw.hr. for quenching and about 8 hr. and 2000 kw.hr. for drawing. The tubes use about 2200 kw.hr. for quenching and 1600 kw.hr. for drawing.

The cost of operating electric heat treating furnaces, based on the work done at the Tioga plant, would be cheaper than oil in a locality where the cost of current is not particularly high. The results obtained at the Tioga plant by heat treating electrically have been carefully tabulated, and



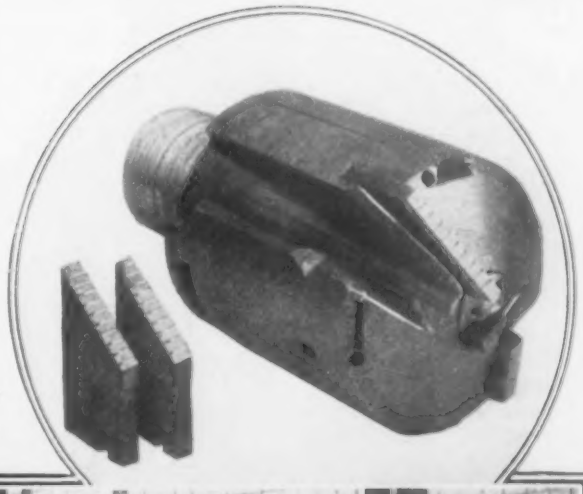
There Are Six of These Oil-Fired Double Chamber Heating Furnaces, Each Chamber Being 8 Ft. 6 In. Deep, 5 Ft. Wide and 3 Ft. 6 In. High. In circle, boring head for rough boring gun jackets and tubes

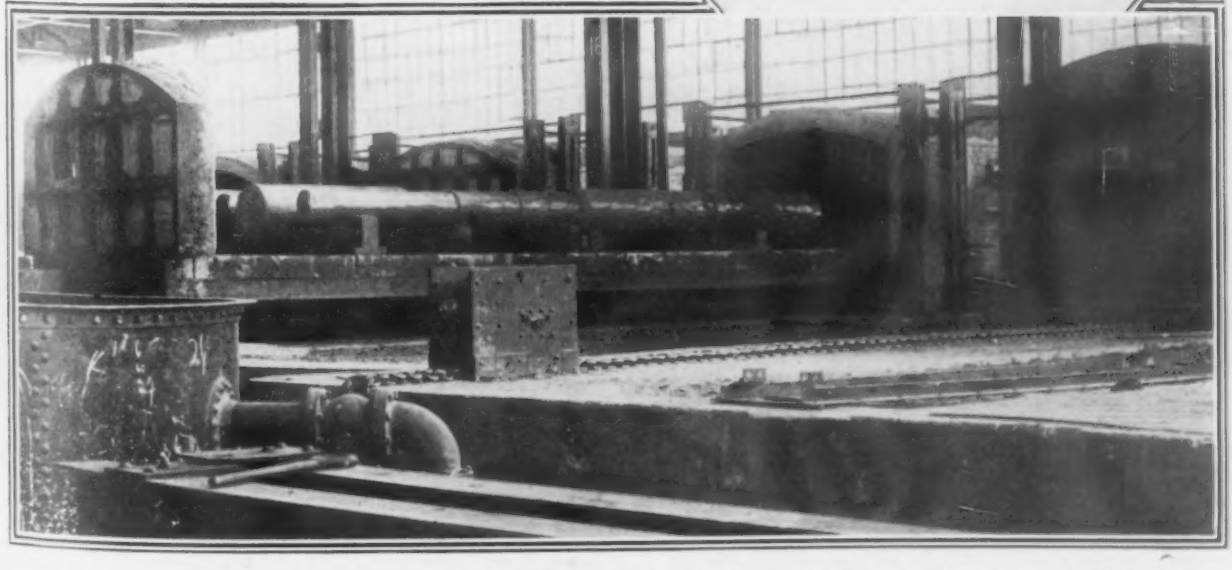
The 1500-Ton Hydraulic Forging Press Is Served by a 20-Ton Crane Which Can Be Controlled from the Crane Cage or from a Fixed Point Alongside the Press

the opinion of the forging experts there is that the chief advantage of the electric furnace over the oil-fired furnace is the elimination of the human element; that is, no skilled heaters are required. The electrically controlled instruments are set at the temperature desired, and they automatically do the heating, resulting, of course, in the accurate heating of all of the different sections.

This uniformity of heating overcomes, it is stated, a great amount of the troubles such as warping usually arising where other methods are used. Consequently there is less time lost in straightening the forgings after heating.

The electric furnaces at this plant are located directly opposite four car-bottom type annealing furnaces, using oil for fuel, which give the forg-





Four Car-Bottom Type Annealing Furnaces Are Located Directly Opposite the Electric Heat Treating Furnaces and Quenching Tank. In circle, the boring head used in Tioga machine shop with cutting tools in place

The upper left illustration shows the progress of the gun forging from the ingot to the machined jacket and tube. At the extreme left is the ingot used for the jacket; next to it is the rough gun barrel after being forged and heat treated, and the piece next to that is the rough machined jacket. At the right are shown the same processes in the making of the gun tube, over which the jacket is shrunk.

At the upper right are the gun jackets and tubes in the holding gear with which they are let into the electric heat treating furnaces and quenching pit.

For the quenching of the forgings is provided a tank 35 ft. deep and 15 ft. in diameter.

ings the preliminary annealing before they are machined.

Each gun consists of a jacket, tube, screw box liner and breech block. The ingots are received from the steel plant, and after being forged, turned, bored, heat treated and tested are ready for shipment to another plant which does the finishing machine work. The jacket is shrunk on the tube, and the screw box liner and breech block fit with the breech mechanism and are assembled. The guns are about 17 ft. long, and each set of forgings shipped from the plant weighs approximately 8000 lb., whereas the forgings when they come from the hydraulic press before machining weigh about 17,000 lb. The handling of this scrap, which is made up of crop ends, borings and turnings, is quite an item, amounting to about 50 tons a day during the peak of production.

A record was made on the one 1500-ton hydraulic press in the forge shop, 12 complete sets of forgings—that is 48 pieces — having been forged in one day of 24 hr. The average production over a period of several weeks was 10 complete sets a day.

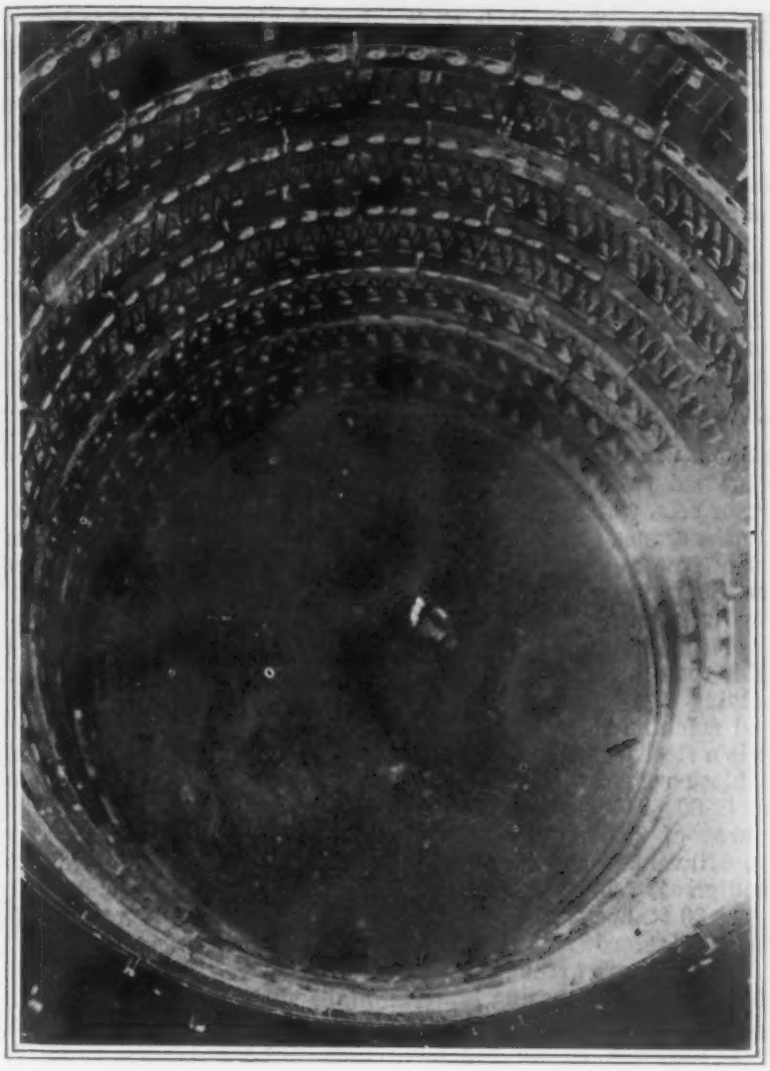
In the machine shop very good results were obtained in boring and turning the forgings, the average speed being:

Turning jackets, 7½ hr.
Turning tubes, 3½ hr.
Boring 3 5/16 in. diameter drills from the solid at the rate of 53 in. per hr.
Boring 5 3/16 in. diameter drills from the solid at the rate of 48 in. per hr.
Boring 7¼ in. diameter drills from the solid at the rate of 36 in. per hr.

The boring head used on the lathes was designed by the company's own engineers.

The forge shop is a steel frame building covered with asbestos protected metal and Lupton steel sash. The main bay is 60 x 280 ft., with two lean-to bays, each 30 by 280 ft. The complete area is 33,600 sq. ft. The shop is served by one 15-ton and two 20-ton Milwaukee electric cranes and one 7½-ton Shaw crane. All cranes are 57 ft. span and are operated by 220-volt direct current motors.

The 15-ton crane is used for unloading forging billets or ingots and for carrying them to the furnaces. It is equipped with magnet and magnet cable winding drum. The 20-ton crane which serves the forging press has double control, that is, it can be controlled either remotely from a fixed point at the forging press or from the cage on the crane in the usual manner. This crane also is equipped with cable winding drum. The second 20-ton crane, which is used for annealing and quenching the forgings, has a lowering speed of 120 ft. per min. with dynamic braking.

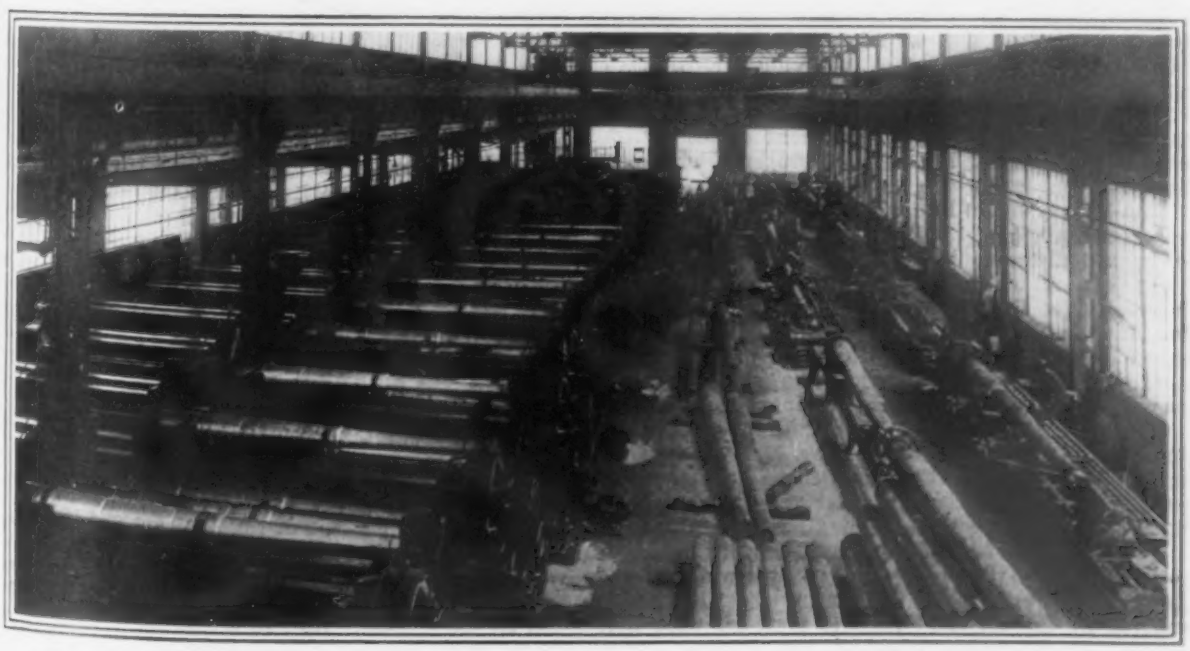


Looking Down Into One of the Electric Heat Treating Furnaces, Showing the Electric Resistance Connections

The 1500-ton hydraulic forging press, located near the center of the main bay, was built by the Mesta Machine Co. The press is flanked by six oil-fired, double chamber heating furnaces, each chamber being 8 ft. 6 in. deep, 5 ft. wide and 3 ft. 6 in. high. Oil is fed to Anthony burners under 50 lb. pressure from a 12,000 gal. service tank, which is buried in the ground outside the forge shop, and fed by gravity from a large storage tank.

Four car-bottom type, oil-fired annealing furnaces of the company's own design are located in the lean-to. The chambers of these furnaces measure 26 ft. deep by 8 ft. wide by 4 ft. 6 in. high, being of a size sufficient to accommodate forgings even larger than those which the plant has been making. These furnaces, like the heating furnaces, are fed by oil from the service tank outside under 50 lb. pressure through Anthony burners. The cars are run in and out of the furnaces by chain operating over sheaves at each end and pulled by overhead crane.

As has already been mentioned, the heat treating and drawing work is done in four vertical electric furnaces designed and manufactured by the General Electric Co. These furnaces and the quenching tank are located in a pit below the level at one end of the shop and directly



A Battery of Boring and Turning Lathes in the Machine Shop, on Which Records Were Achieved Through the Use of the Boring Head Shown on Pages 674 and 675

opposite the annealing furnaces. The tank is 15 ft. in diameter and 35 ft. deep. Uniform cooling of forgings after drawing is provided for by vertical insulated cast iron tubes with covers, located in the extreme end of the shop in a wing of the heat treating pit.

The forge shop is also equipped with a 500-ton Southwark horizontal acting hydraulic straightening press and a 52-in. Newton cold saw, used for cutting off forging ends.

Electric current is taken at 13,200 volts from the lines of the Philadelphia Electric Co. and delivered at 400 volts through three k.v.a. General Electric transformers located in the sub-station building, which is constructed entirely of brick walls with fireproof doors, being located in one corner of the forge shop. In another section of the sub-station are located two 500-kw. General Electric motor generator sets, which deliver direct current at 220 volts to the cranes and other motors requiring it, also the power switchboard and switchboard for electric furnaces, which contains 16 Leeds & Northrup instruments for automatically recording and controlling temperatures of these furnaces. In this room is also a 1000 cu. ft. air compressor supplying compressed air to all parts of the forge and machine shops.

The machine shop is a steel frame building with brick walls, gypsum block roof and Lupton steel sash. The main bay is 60 x 240 ft., with lean-to 30 x 240 ft., a total area of 21,600 sq. ft. It is served by two 10-ton Milwaukee electric cranes. The machine-tool equipment consists of three 36 x 36 ft. and three 36 x 30 ft. heavy duty turning lathes, made by the Bridgeford Machine Tool Works, Rochester, N. Y., which are arranged along the East wall, and 16 36 x 52 ft. gun boring lathes, also of Bridgeford make, arranged across the shops, two to a 20 ft. bay, the boring bar end projecting under lean-to. There are also one 12 ft. and one 14 ft. lathe for boring and machining breech plugs and screw box liners. Two Newton cold saws, 36 in. and 48 in., and a 72 in. heavy duty radial drill complete the tool equipment except, of course, the tool-making department, which is enclosed in one corner of the building.

The boiler house is equipped with two 500-hp Springfield water tube boilers with Westinghouse-Roney stokers, and superheaters. There is a coal crusher on the track outside the boiler house which feeds through a bucket elevator to a 75-ton concrete storage bin, from which skips carry coal to the stoker hoppers. Ashes are conveyed by live steam from the ash pit under the boiler grates to a brick ash tank outside the boiler house. The machine shop and office building are heated by exhaust steam from the forging press, drawn through pipes by a vacuum pump located near the press in the forge shop.

The Tioga Steel & Iron Co., which is a subsidiary of the Taylor-Wharton Iron & Steel Co., on Aug. 4, 1917, was awarded a contract by the Navy Department for the rough forging and rough machining of 8,000,000 lb. or 1044 complete sets of 4 in. naval guns. To fill this contract it was necessary to erect the gun plant above described, adjoining the company's old plant. The buildings were completed and turned over by the contractor on Feb. 5, 1918; the first gun was forged on March 19, 1918 and machined April 4, 1918. The first guns were shipped May 29, that year, since which time production each month increased. In October 150 complete gun sets were shipped, and if the armistice had not been signed 200 sets would have been shipped in November.

This work was done with a working force of 350 men, the day shift working 11 hr. and the night shift 13 hr., prior to the Government order reducing shifts to two of 8 hr. each after the armistice was signed. The Tioga plant will complete its contract April 1, after which commercial forging work will be undertaken.

STATE COMMISSION RULING

Steel Companies Entitled to Allowances from Trunk Lines

HARRISBURG, PA., March 11.—Railroads of steel and iron companies, as well as other industrial railroads, are entitled, under a ruling of the Pennsylvania Public Service Commission just promulgated, to allowances from trunk lines for placing cars for loading or unloading within the limits of the plant owned by the company of which the lines are the property, when performed in connection with an inter-state haul.

The Pennsylvania, Baltimore & Ohio and other railroads complained of by Pittsburgh district steel companies are directed to restore the tariffs by April 1 in the decision, which was rendered in the cases of the National Tube Co., Carnegie Steel Co. and the American Steel & Wire Co., which complained months ago against six trunk lines for refusing to pay the allowances for the services of the "short line" railroads which are owned by the manufacturing companies.

The St. Clair Terminal, Etna and Montrose, Pittsburgh & Ohio Valley, Mercer Valley, McKeesport Connecting, Northern Liberties and Denora Southern railroads intervened. Other manufacturing corporations and their railroads will be affected by this decision.

In the decision handed down by Chairman W. D. B. Ainey it is held that there was no evidence that the allowances were too high. Testimony that the service tendered by the terminal lines is identical with that tendered by the trunk lines to the industries in the same territory without charge, in addition to the line haul rate, was not controverted. The Pittsburgh rate group, in which they belong, extends over 6058 square miles and has not been questioned. The decision holds that the operation of the industrial railroads promotes economy and efficiency.

Diagram of Steel Manufacture

The diagram of steel manufacture which THE IRON AGE has been sending to subscribers and others interested has been mailed to many parts of the country to people engaged in widely varying lines of business. The designer of the diagram, which shows graphically the various stages in the manufacture of steel, is F. B. Woodworth of the Carnegie Steel Co. In a recent letter to THE IRON AGE, Mr. Woodworth said:

"I am glad to note that the diagram has proven so popular and I am very grateful that your co-operation has enabled us to furnish what I believe will be a real service to the industry."

The few remaining copies of the diagram will be sent upon request at three cents per copy, but not more than ten can be sent to any one address.

A New York meeting of the National Safety Council will be held at the Safety Institute of America, 14 West Twenty-fourth Street on Thursday evening, March 13, at 8 o'clock. It will be devoted to a discussion on the subject: "How to secure the cooperation of the workmen in the use of safety devices."

Die Castings and Their Use in the War*

Progress of the Industry—Machines, Dies and Alloys Used—Elongation of the Metal an Important Property

BY CHARLES PACK

DIE castings are metal castings made by forcing molten metal, under pressure, into a metallic mold or die. It is necessary to keep this definition in mind to avoid confusing this process with other permanent-mold casting processes. The fundamental principles of the process have been known and practised many years. The simplest application is embodied in the modern linotype machine in which molten metal (usually tin-lead alloy) is forced under pressure into a metallic mold. The pressure is derived from a piston and cylinder immersed in the molten metal.

Types of Casting Machines

The problem of delivering molten metal under pressure into a die is comparatively simple, when dealing with low-fusing-point alloys, as the alloys of lead and tin, but it is much more complicated when dealing with metals of higher fusing points, such as the alloys of zinc, aluminum and copper. Although the art of die casting is comparatively new, the records of the patent office are replete with patents on the subject.

Fig. 1 shows the Underwood machine patented in 1902; this is probably one of the first machines designed for the production of commercial die castings. The relation of this machine to the linotype casting machine is clearly apparent. A cylinder and piston are immersed in the molten metal, the application of power to this piston forcing the molten metal, under pressure, into the mold or die. The Doehler machine, Fig. 2, patented in 1907, is based on the same general principles. This machine is used to a large extent at the present time, throughout the United States, for the production of zinc, tin and lead alloy die castings.

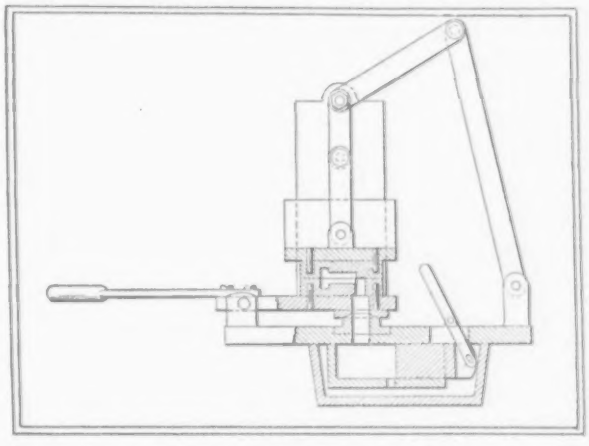


Fig. 1—Underwood Die-Casting Machine Patented in 1902

In a machine patented by Chandler in 1914, shown in Fig. 3, the principle of the internal-combustion engine is applied for exerting pressure on the molten metal. A charge of gasoline vapor and air is injected into the melting chamber, the explosion of which forces the metal into the die. The writer has never heard of this machine being used on a commercial basis, but it is mentioned to show the various means suggested for forcing molten metal into a die.

How to Avoid Blow-Holes

The fact that die castings are made under pressure would suggest dense and homogeneous castings; this impression, however, is not in accord with actual practice. On fracture, the pressure die casting will be found to consist of a dense closely grained outer stratum and a porous inner stratum. Blow-holes of varying size may be expected in the center of the die casting, particularly through heavy sections. Many machines have been designed with the primary object of overcoming this difficulty and producing solid die castings.

The production of die castings free from blow-holes has been the most serious problem confronting die-casting manufacturers. At various times it has been stated that processes capable of producing solid and homogeneous die castings have been developed. If all blow-holes in die castings were caused by air coming in contact with metal, the vacuum process would deserve consideration. That the presence of blow-holes in some die castings are due to other and more serious causes, the writer will endeavor to prove.

In Fig. 4 is shown a cross-section of a casting that can be gated at *A* or *B;* in the best foundry practice the gate *A* would probably be used. The first metal that goes into the die will chill around the inner walls and take the form shown in the shaded portion. The gate may then become chilled before the inner portion has been filled; this will cause blow-holes that no vacuum will eliminate. A similar effect will be produced if the metal was too cold at the time of casting.

The writer has produced castings having only an outer shell, similar to that shown in Fig. 4, by limiting the amount of metal injected into the die to a quantity less than that required to make the casting. A similar result may be obtained by running the metal so cold that it will chill the thinner sections of the casting before the heavier sections are completely filled. Lack of pressure will produce the same result.

Blow-holes in die castings may also be caused by the phenomenon called piping. Makers of rolling-mill ingots have often been confronted with this problem. In Fig. 5 is shown cross-section of another casting gated at *A*. The metal flowing into the die at *A* will fill the entire mold cavity, assuming all casting conditions to be ideal, but the metal in the thin section adjoining *A* will chill before the heavier section so that, the chilling being from the outside, a shrinkage hole will be left in the center. Here again no advantage can be gained by the use of the vacuum system.

Composition of Dies and Alloys Used

In the manufacture of die castings from zinc, tin and lead alloys, dies made from low-carbon machine steel last almost indefinitely and answer every purpose. In the first attempts to die-cast aluminum, the problem of obtaining a suitable die material presented serious difficulties, which were described by the writer in a paper read before the American Institute of Metals in 1915. This problem, however, has been solved by the use of various alloy steels making possible the commercial die casting of aluminum and its alloys, which constitutes the greater part of the die-casting industry of to-day. The proper gating and venting of these dies are problems that arise daily and on their solution depends the success or failure of the process.

In a paper read before the American Institute of Metals in 1914 [THE IRON AGE, Sept. 24, 1914], the writer described the various types of zinc, tin and lead alloys used in the die-casting process. The application of these alloys and their limitations were also pointed out. At that time the die casting of aluminum and its alloys was barely beyond the experimental stage.

*From a paper presented at the February meeting of the American Institute of Mining Engineers in New York, Feb. 15 to 20. The author is chief chemist, Doehler Die Casting Co., Brooklyn, N. Y.

During the past four years the most important advance in the art of die casting has been made in the perfection of the process for die-casting aluminum and its alloys. The importance of this achievement as an aid to winning the war is best demonstrated by the fact that at least 95 per cent of the die-cast parts used directly or indirectly as materials of war were made from an aluminum-base alloy. Of these castings, only a very small percentage could have been produced successfully in 1914.

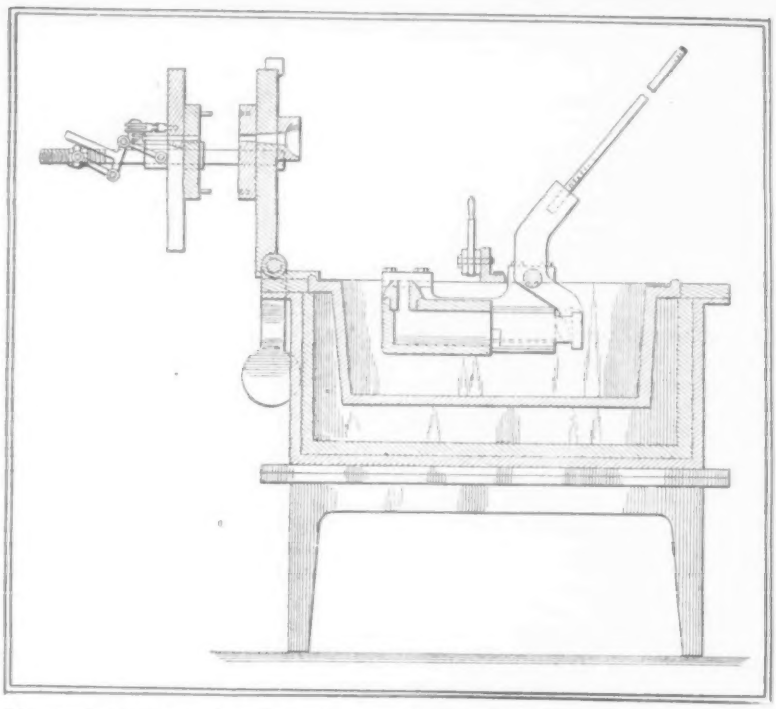


Fig. 2—Early Type of Doehler Machine, Patented in 1907, and Now Used to a Large Extent at the Present Time

Requirements of Die Castings

Investigations of the casting properties of metals and alloys in the past have been generally limited to sand castings; few data are available as to the costing properties of metals or alloys in metallic molds. Just what constitutes a good die-casting alloy is a subject of unusual interest. A few of the important requirements, outside of the usual physical properties demanded of alloys, are:

Melting Point.—The successful die-casting machine in every instance is constructed of iron, in one form or another. The melting point of the alloy must be such that it will melt readily in an iron pot.

Solvent Action.—The solvent action of the alloy on iron must not be too great. Molten aluminum dissolves iron very rapidly and analyses of aluminum die castings on the market will show an iron content of from 1 to 3 per cent, due to the solvent action. Fortunately, there is no serious objection to the presence of iron in aluminum casting alloys. Should the aluminum absorb much above 3 per cent iron, the melting point becomes too high and the alloy becomes viscous and unsuitable for making castings.

Elongation.—The elongation of the metal is of vital importance in determining the die-casting properties of an alloy. Not only is it desirable to know the elongation of the alloy when cold, but it is of greater importance to determine the elongation at various temperatures ranging from the melting point of the alloy down to normal temperature. The reason for this becomes apparent when the physical phenomena of the die-casting process are considered. Let us assume that a ring 12 in. (30.48 cm.) in diameter is to be die-cast in a metallic mold around a metallic core. As the molten metal strikes the mold it solidifies. Here a change of state occurs that is accompanied by a reduction in volume, commonly termed shrinkage. Unlike a sand core, the metallic core is not compressible and retains its original size and form so that the shrinkage of the metal is converted into a stretching action on the solidified casting. If the elongation of the alloy at that temperature is not high enough to withstand this stress the casting will crack. In the usual die-casting practice it is not practical to remove the casting from the die at the solidification temperature of the alloy. For example, the solidification temperature of the aluminum-copper alloys used in the die-casting process is approximately 1150 deg. Fahr. (621 deg. C.). It has not been found practical to run the casting dies above a temperature of 500 deg. Fahr. (260 deg. C.), which means that the castings are withdrawn from the dies at that temperature. It follows that the casting is subjected to another stretching stress after the casting has solidified, due to the contraction in volume that must occur when a casting is cooled from a temperature of 1150 to 500 deg. Fahr.

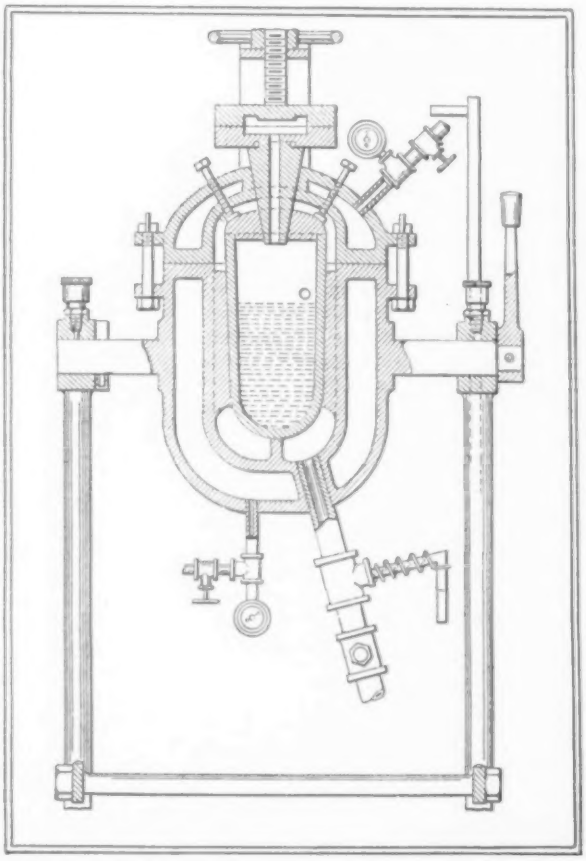


Fig. 3—Chandler Die-Casting Machine. Patented in 1914. The principle of the internal combustion engine is used for exerting pressure on the molten metal

Determining Elongation of Alloys

The writer has been unable to find any reliable method for determining quantitatively the elongation of alloys at various temperatures. Many methods have been suggested but they have proved of doubtful value. The simplest way is to use the old "try-and-see" method. To test the alloy, a casting is made in a die having a comparatively large core and thin wall. If the alloy can stand the casting stress, a perfect casting will be obtained, otherwise the casting will show bad cracks. Only a comparative result is obtained, but for everyday control it answers the purpose. However, a simple and reliable method for determining quantitatively the elongation of metals and alloys at various temperatures would prove of enormous value to all metallurgists engaged in the various phases of metal-casting research.

It is interesting to note that the elongation of a metal or alloy at normal temperatures is no indication as to the properties of that metal or alloy at higher temperatures. The writer has found many cases where an alloy showing little or no elongation at normal temperatures shows a high elongation at higher temperatures. The alloys of aluminum and copper may serve to illustrate this point. It is well known that the addition of copper to aluminum reduces the

elongation of the aluminum alloy. An aluminum alloy containing 12 per cent copper will show less elongation than an alloy containing only 6 per cent copper when tested at normal temperatures. Nevertheless, the 12 per cent copper alloy has a greater elongation at higher temperatures than the 6 per cent alloy, and consequently the 12 per cent alloy is better able to withstand the casting stresses to which it is subjected in the die-casting process.

In the early days of the die-casting industry alloys were compounded indiscriminately and little or no consideration was given to the metallurgical principles involved. The manufacturer in many instances knew much more about machinery than about metals. The result was that there were put on the market die castings made from alloys that deteriorated rapidly and created a prejudice among engineers against the use of these castings. That this prejudice was in part justified must be admitted; nevertheless, the modern die-casting plant is equipped with physical and chemical testing laboratories and the die-casting practice of to-day bears no relation to that which was accepted generally five years ago.

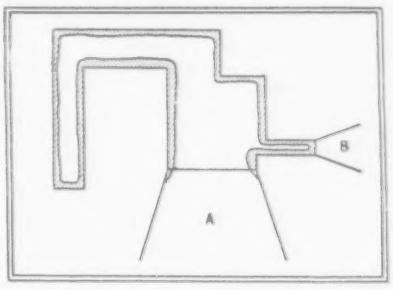


Fig. 4—Cross Section of a Casting with Two Gating Positions

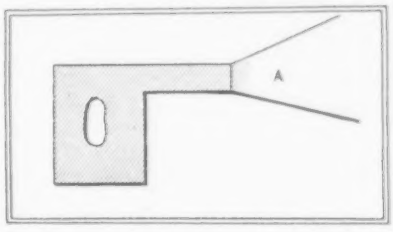


Fig. 5—Die Casting Containing a Shrinkage Hole

Die Castings Made for War Purposes

Die castings have had their most severe test during the past two years, during which time most of the die castings manufactured were used directly, or indirectly, in the Government's war program. Here is a partial list of the application of die castings for this purpose.

Gas masks, breather tubes and other metal parts.

Lewis machine guns, 100 die-cast parts to every gun.

Browning machine guns, four of the most vital parts.

Navy and army binoculars, the entire housing.

Army truck, tank and airplane die-cast parts include parts of ignition system, carburetor, gasoline-regulating devices, steering-wheel accessories, ball-bearing cages, bearings, speed indicators, etc.

Pistol, complete signal pistol.

Submersible bombs, some designs contained as many as 10 die-cast parts.

Hand and rifle grenades, every grenade manufactured in this country contained one or more die castings.

Trench mortar shells, plugs die cast.

Airplane drop bombs, one or more die-cast parts.

Surgical instruments, including hair clippers, respiratory devices, etc.

In many instances die-cast parts were used where the failure of the part would result in serious loss of life. The fact that not one failure of a die casting has been reported must continue to be a source of deep satisfaction to the modern die-casting manufacturer.

Conference of Industrial Engineers

A national conference of the Society of Industrial Engineers on industrial reconstruction problems will be held at the Hotel McAlpin, Broadway and Thirty-fourth Street, New York, from March 18 to 21, inclusive, to which all interested are invited. The morning sessions (held on all except the first day) will convene from 10 o'clock until noon; the afternoon sessions will start at 2.30 o'clock (except Friday, when the hour is 2); evening sessions, at 8 (except Thursday, 7 o'clock, and Friday, omitted).

Tuesday evening is devoted to "Manufacturing and Production Problems" and consists of the following program: "Organizing Industries for Economic Production", C. E. Knoeppel, president C. E. Knoeppel & Co., Inc., industrial engineers, New York; "Necessity for Quantity Production—Through Increased Efficiency", J. E. Otterson, vice-president and general manager Winchester Repeating Arms Co., New Haven, Conn.; "Work of the Bureau of Standards as Related to Industrial and Commercial Problems", illustrated with stereopticon views, Dr. S. W. Stratton, director Bureau of Standards; "Costs in a Competitive Market", Clinton H. Scovell, Scovell, Wellington & Co., accountants and engineers, Boston.

The subject Wednesday evening is "Labor Problems—The Employers", the program being as follows: "Industrial Relations", Irving A. Berndt, vice-president C. E. Knoeppel, Inc., New York; "Personnel Classification", Colonel Walter Dill Scott, adjutant general's department; "Employment and Readjustments of Labor", Magnus W. Alexander, director National Industrial Conference Board, Boston; "Control of the Job", Meyer Bloomfield, Boston; "Employment Management", Dudley R. Kennedy, Philadelphia.

An informal banquet will be held Thursday evening, the toasts pertaining to "Industrial Engineering—the Profession", presided over by L. W. Wallace, Diamond Chain & Mfg. Co., Indianapolis, and president the Society of Industrial Engineers. The ideals, scope, future, professionalizing and nationalization of industrial engineering will be treated by speakers who include Prof. Dexter S. Kimball, Cornell University; Harrington Emerson; F. C. Schwedtman, vice-president National City Bank, New York; and Louis C. Marburg, Marburg Brothers, exporters and importers, New York.

The morning sessions will take the form of round table conferences. The following will be the topics of the afternoon sessions: "Trade, Commerce, and Finance"; "Labor Problems—the Workers"; "The Influence of Engineering Education", conducted by Dean Herman Schneider of the College of Engineering, University of Cincinnati; and "Labor Saving Equipment as a Factor in Maximum Production and Fatigue Elimination," with a contribution by Mrs. Frank B. Gilbreth, Providence, R. I.

There will be an exhibition of labor-saving equipment for both factory and office, and educational features, 35 companies contributing; also an exhibit of personnel work in the Army.

Taylor Society to Take Offices in New York

The Taylor Society will open a permanent office in the Engineering Societies Building, 29 West Thirty-ninth Street, New York, on April 1. The activities of the Society will be conducted from this office by Dr. Harlow S. Person, who assumes the title of managing director. Dr. Person has been president of the Taylor Society for the past few years. He is director of the Amos Tuck School of Administration and Finance, Dartmouth College, Hanover, N. H., and professor of organization and management with that institution. He severs his connection with the Tuck School and will devote his entire time to the affairs of the Taylor Society on assuming office.

The New York Chapter of the American Association of Engineers will hold a meeting on Friday evening, March 28, at 8 p. m. at the Hotel McAlpin, New York. C. E. Drayer, national secretary, will address the meeting on the aims and accomplishments of the American association.

The Betts Machine Co. and Bridgeport Machine Tool Works, both of Rochester, N. Y., have established a New York office at 50 Church Street, with F. C. Severin in charge, and a Chicago office at 549 Washington Boulevard, with A. W. VanBuren in charge.

ADJUSTING CLAIMS

Procedure of the War Department Outlined in Special Circular

WASHINGTON, March 11.—The formal procedure by which the War Department has decided to adjust the $2,700,000,000 worth of informal and technically invalid contracts, which were validated by a special act of Congress, are important to the entire iron and steel industry, and especially to those who have claims to file.

A special supply circular, No. 17, has been issued by the Division of Purchase, Storage and Traffic outlining the machinery for this adjustment. It calls particular attention to the fact that "the act does not authorize the execution of contracts which have not heretofore been properly executed; the bureaus shall not execute contracts with respect to agreements covered by the act, but shall proceed in the manner hereinafter provided."

Then the circular outlines the following classification of claims:

For the purposes of administration, claims presented to the Secretary of War under this act will be classified as follows:

Class A.—Claims based on agreements made by an officer or agent acting under the authority, direction or instruction of the Secretary of War, and the nature, terms and conditions of which have been reduced to contract form or are otherwise established by written evidence.

Claims B.—Claims based on all other agreements covered by the provisions of Section 1 of said act.

With respect to class A claims, the circular provides as follows:

Form and Method of Presentation

(a) Claims falling under class A shall be presented in the form of "Statement of claim form A" hereto attached. They shall be prepared and presented in quadruplicate, each copy being duly executed and verified. The four copies shall be forwarded to the Claims Board in Washington of the bureau with which the alleged agreement was made. Proper addresses are as follows:

Ordnance Claims Board, War Department, Washington.

Claims Board, Air Service, War Department, Washington.

Claims Board, Chemical Warfare Service, War Department, Washington.

Claims Board, Construction Division, War Department, Washington.

Claims Board, Director of Purchase, War Department, Washington.

Claims Board, Signal Corps, War Department, Washington.

Claims Board, Office Chief of Engineers, War Department, Washington.

(Claims based on agreements with the Quartermaster Corps should be addressed to the Claims Board, Director of Purchase, as above.)

(b) Attention is called to the fact that under the act these claims must be filed and duly supported by itemized statements before June 30, 1919.

(c) In all cases where settlement negotiations with respect to such agreements are now pending, the negotiations will proceed without interruption, but no award can be made until after the statement of claim has been filed in Washington, and the nature, terms and conditions of the agreement certified by the proper bureau claims board and approved by the claimant, all as hereinafter provided for.

(d) For further information claimants should apply to the proper bureau claims board in Washington, or to its nearest local representative. All supply bureaus of the War Department are directed to facilitate in every way the prompt and proper presentation of these claims.

Procedure in the Bureaus After Filing of Claims

(a) On the presentation of any claim to the Claims Board of a supply bureau all copies of said claim are to be immediately endorsed as follows:

Received by.....
Name of officer or agent.

.....
Date..... day of ..... 1919.

Each claim will receive an identifying number which shall be of a series not at present used in the bureau, and a record made of its receipt and disposition. In the event that claims are improperly directed to a bureau and have to be reforwarded from the board of that bureau to the board of another bureau, they are, nevertheless, to be numbered and stamped with the name of the officer or agent receiving them and the date so that the fact of their presentation to the Secretary of War before June 30, 1919, may be clearly established. When forwarded to another board, that board will give them an identifying number of its series and they will thereafter be recorded and known under that identifying number.

The procedure for the class B claims is less complicated. It follows:

Form and Method of Presentation

(a) Claims falling under class B shall be presented in the form of "Statement of Claim Form B" hereto attached. They shall be prepared and presented in sextuplicate, each copy duly executed and verified. The six copies shall be forwarded to the Board of Contract Adjustment, Munitions Building, Washington.

(b) Attention is called to the fact that under the act these claims must be filed before June 30, 1919.

Procedure by the Board of Contract Adjustment on Class B Claims

(a) Class B claims shall be submitted to the Board of Contract Adjustment, which, in handling them, will follow the procedure above outlined for class A claims so far as it is applicable; but those claims which are based upon alleged agreements entered into with an officer or agent acting under the authority, direction or instruction of the Secretary of War shall be kept separate and given numbers of a different series from those entered into by an officer or agent acting under the authority, direction or instruction of the President; and the forms of award used by the Board of Contract Adjustment shall provide for signature by that board and approval by the War Department Claims Board.

(b) The Board of Contract Adjustment will establish, under the direction of the War Department Claims Board, procedure for the proof of claims pending before it.

(c) The Board of Contract Adjustment may, in any case where the nature, terms and conditions of the agreement have been established and certified by it, refer the claim to the appropriate Bureau Claims Board for action and for recommendation of a fair and equitable basis upon which the agreement should be adjusted, paid or discharged, and the Bureau Claims Board shall then proceed in the manner provided in sub-sections d, e, f and g of Section 3 hereof and in the following general provisions.

Before executing any certificate as to the nature, terms and conditions of an agreement the Bureau Claims Board of Contract Adjustment shall satisfy itself that the agreement comes within the provisions of section 1 of the act. Where, with respect to any claim, a Bureau Claims Board or the Board of Contract Adjustment finds that no agreement within the provisions of Section 1 of the act has been made, it shall certify to that effect, and transmit a copy of the certificate to the claimant.

In the event that the claimant is not willing to accept a finding made or an award recommended by a Bureau Claims Board, he may appeal to the Board of Contract Adjustment.

Wherever any question arises as to whether a particular bureau claims board or the Board of Contract Adjustment should pass upon a claim under these regulations, that question shall be referred for decision to the War Department Claims Board.

There shall be prepared and preserved within the bureau and in the office of the Board of Contract Adjustment, for transmission to Congress under the direction of the War Department Claims Board, in each case a copy of the certificate of the Board setting forth the nature, terms and conditions of the agreement, together with a copy of the award showing the nature of the payment or adjustment thereof.

Attention is called to the fact that in all proceedings under the act witnesses may be compelled to attend, appear and testify and produce books, papers and letters or other documents.

Bureau claims boards and the Board of Contract Adjustment are directed to present to the War Department Claims Board any special cases or classes of cases in which they find that the forms provided for herein cannot adequately or appropriately be employed, and to recommend appropriate forms.

Forms are provided for the various filings.

The American Sheet & Tin Plate Co., Frick Building, Pittsburgh, has discontinued the manufacture of Wood's patent planished iron sheet and is manufacturing instead its Keystone hammered polished sheets, which are made from a copper steel base.

The League of Labor and Capital*

Co-operation in Industry Between Employer and Employee—Basis for Representation—The Importance of a Fair Understanding

BY C. S. ROBINSON†

ANY successful plan of dealing with employees must be founded on honesty of purpose, freedom from suspicion, and a due regard for the rights and aspirations of the workmen, as well as of the rights of employers and of the public.

Importance of a Common Knowledge of Industrial Conditions

A proper representation plan makes it possible to educate employees, at least to the extent of a knowledge of conditions of trade that affect them persnally, such as the competition existing in certain lines and in certain localities and its effect on plant operations; as to what labor laws now enacted do to their particular trade and to plant costs; and how disastrously even good State laws, instead of National laws may act as regards their own interests. It should also result in educating the management at first hand as to the natural and proper desires of the workmen.

There is much talk at this time of world markets. Can American standards of wages and living be maintained and permit us to compete with foreign nations; and if not, what is to become of surplus manufactures, and how is employment to be provided?

With proper and friendly contact set up as by a representation plan, I am sure much good can be accomplished among the men by joint conferences, and a better understanding of the common interests and answers to such questions arrived at.

Many of us may not as yet have reached the state of mind necessary to regard industry primarily as a social service based on the effort of every individual to discharge his duty to his neighbor and to the community, but let us not pass that thought by lightly. Rather should we try to fully understand the potentiality of such a vision of industry, while not losing sight of the fact that economical production of goods is essential and that a profit must be derived from industry in the interests of all.

We have come to hear frequently of what some are pleased to call "human engineering," which has to do with the people employed in industry. It has a large and, up to this time, poorly cultivated field; therefore great opportunities still exist for constructive betterment. Industry and humanity are inseparably linked and industry cannot reach its highest development unless the human element is most carefully considered and right and justice made the basis of all relationships.

The Danger of Even Slight Misunderstandings

Most of the serious difficulties that arise between employers and employees have their birth in slight misunderstandings, largely due to ignorance of the real facts. There has been, and is, lack of vision and too much Bourbonism at the head and through the management of many industrial institutions.

Many managers are more or less mentally indolent and take what to them seems to be the easiest because quickest way. Instead of basing their judgment on a square deal, principles of right and justice, they temporize or do what to them seems expedient, overlooking the ultimate results on future relations. While it is absolutely essential for harmony in industrial relations and the attainment of highest efficiency that all parties shall have faith in each other, that suspicion shall be put aside and a state of mutual respect and confidence shall be firmly established, this cannot be secured without the proper avenues of approach and means of contact.

It is believed that Charles Evans Hughes is absolutely right when he maintains "There are no difficulties in the field of industry which cannot be solved if we insist on methods of justice," that "the recognition of the right of representation and the prompt hearing of grievances, provide the open doors to reasonable and just settlements." Mr. Taft holds much the same views, and both have had wide experience in practical affairs.

Many employers have known that the relations existing in industry were out of balance and have tried, some because of desire to see justice done, and others because they considered it "good business," to put in effect numerous ways to overcome antagonism and bring about kindlier feelings. Probably all are more or less familiar with experiments that have been made with the hope of bringing about a better condition.

Profit Sharing No Panacea

I have long been interested and connected with and have tried to be watchful of results obtained from educational and welfare work, thoughtfully undertaken and carried out, with medical and hospital systems, maintained partially by employees, as well as wholly by the corporations; also with several so-called profit-sharing schemes. There has always been something vital lacking.

The disappointing results from profit-sharing plans with which I have been familiar have by no means proved to my satisfaction that profit sharing in itself is wrong in principle, but have convinced me that it will not accomplish the results wished for, where only one partner in industry distributes the profits and the other partner or partners are not taken into the confidence of the distributor.

Satisfactory profit sharing, where all parties have had the proper look-in, has been accomplished, it is claimed, in mercantile establishments of different kinds and will probably be worked out some day in industry; not, however, until the stockholders, management and workmen in industrial concerns so far put aside the purely selfish desires of each as to reach a working basis, fair to all, because careful consideration has been given to the rights of capital, of labor, and of the community.

Much has been said and written of these rights and they should be made a matter of common knowledge by every means of education possible.

The Experience at Youngstown Sheet & Tube Plant

For a long time the Youngstown Sheet & Tube Co. has been active in welfare work; the aim at all times being not to carry it on as a charity, but in a spirit of helpfulness.

Realizing that we had not obtained all the objects sought in the way of creating and cementing feelings of harmony and friendliness, nearly three years ago we introduced a system devised to study industrial relations, as then existing, with a view to remedying what might be found wrong.

When the industrial relations department was organized it took over the direction of the employment bureau, the chief surgeon, his assistants, nurses and hospital, and the welfare activities, including the visiting nurses.

This work gradually but steadily expanded until practically all employees at the different works went

*From an address before the National Conference of State Manufacturers' Associations at St. Louis, Feb. 13-14.

†Vice-president Youngstown Sheet & Tube Co., Youngstown, Ohio.

through it both when hired and when paid off. It was the quarter all could go to for information of all kinds.

Great consideration was given to investigating complaints, settling misunderstandings, effecting transfers from one department to another, and through a legal branch, which was later added, much inconvenience, in fact, many injustices from outsiders, especially to foreigners, were done away with and in the aggregate they were saved a large amount of money.

This, then, was the general condition existing at the time it was decided to go a step farther.

A thoughtful study was made of the representation of employees, as carried out in the mines and steel works of the Colorado Fuel & Iron Co., especially as to its accomplishments over a period of some three years, for it was found the management, the representatives and the men practically were a unit in testifying to its success.

Other plans more or less based on this one, as approved by the War Labor Board, were not overlooked, nor was the benefit of outside experience neglected.

When a request came from employees for the consideration and adoption of a plan of representation, it was decided to outline one and arrange so that t could elect delegates from the different departments of the works to meet the management and work it out.

During the war our employees organized what was known as the Patriotic Committee, which had charge of the raising of money for Red Cross, Y. M. C. A. War Work, War Chest and other activities, as well as the sale of Liberty Bonds.

This committee was made up of approximately 600 men from all departments and included superintendents, foremen, skilled and unskilled employees.

At a meeting of this committee held to felicitate its members on its remarkable success, the occasion was taken to speak of the request for a plan of representation, and the members were given an opportunity to say whether or not it appealed to them. The vote was unanimously in favor of adopting some suitable plan and it was agreed that company officials, salaried employees, or those having the power to hire and discharge, should not be included, as they were already provided for. The wage earners of this committee, representing each department, then retired from the meeting and were provided with places to choose a committee from their respective department, to hold an election of one delegate from each department (seventeen in all) to meet with the management, empowered to discuss and approve a plan of representation, and then to hold an election of representatives under the provisions of the plan approved.

As adopted, it more nearly resembles the plan in force at the Bethlehem Steel Co.'s plants, but is quite materially changed to better suit our conditions and amplified so as to more clearly define the procedure to insure the just rights of stockholders and of employees, as well as to make it more adjustable in the event of subsequent changes in conditions.

A Clear Understanding

In order to have the wage-earners enter into any plan with the personal interest necessary to make it successful, its features must be so plain and the method of execution so fair that just suspicion cannot attach to it. It also should be so conceived and executed that any misgivings that might at first be felt would soon give way to faith in it, and that knowledge of its operations would overcome any existing prejudice or doubt.

There appears to be no better pattern than the town meeting that many of us have been accustomed to. Here a representative is not chosen because he is a minister, a lawyer, a mechanic or for his special training in some particular branch, but ordinarily because of his character and the confidence that his fellow townsmen have in his ability and willingness to serve their interests, even if at times opposed to his own.

Representatives under the plan adopted in our plant are chosen by all entitled to vote in each division, and therefore do actually represent all in that division, skilled, semi-skilled and laborers. To do their duty they must in a large measure unselfishly meet the problems arising, and must study what is best for the greatest number of those they represent. Our experience so far is that the men chosen as representatives feel this trust and are making an honest effort to execute it. In the joint conferences we know much stress is laid on their recognizing that it is to their best interest to smooth out and overcome difficulties or grievances in their incipiency. We believe they are pursuing this course in their own committee conferences.

Important Features of the Plan

The prominent or outstanding points of the plan adopted, resemble in the main similar points in others. The stockholders, management, and men we feel are perhaps more clearly safeguarded in their rights and the machinery for adjusting differences such that there should be no personal discrimination against employees or representatives.

The fundamental policies of the company are retained, the powers necessary to an enlighted management are not abridged, nor are the rights of the men, which are defined and protected to a degree that there should be no fear on their part of injustice being done. The door is open for adjustment of difficulties and appeal to higher authorities.

It is appreciated that to many employees the question of wages is paramount, but it is thoroughly understood that the stockholders and management have not altered the fundamental policy of making general wage adjustments and must be governed by what is found necessary in the steel industry, and what obtains in the district affected. Questions of piece-work, bonuses, etc., can be discussed, and the adjustment of inequities receive merited attention.

One concern alone cannot fairly be expected to maintain standards that would in times of sharp competition cause it financial loss, for this would not in the long run be to the interests of any of the parties.

Public opinion can be largely molded by the combined efforts of capital and labor, and a realization of the requirements of both through honest statement and proper explanation will compel a just recognition by the community.

It is believed that open-shop conditions, maintained under the plan in question, offer at this day and age the most advantage to stockholders, management, employees and to the community. Any plan to be a success in the end cannot ignore for long the interests of these four partners in industry.

Unless the majority of the employees of a concern want to have representation it is advised not to attempt to force it. If wanted and there have been no existing agencies at work in preparing and educating the men, foremen and all interested so that it would be undertaken with the honest intention of all to work in harmony and in a spirit of fairness and justice, it would be better, in my judgment, to postpone its adoption until this relationship can be established.

Initial steps for the formation of a safety council in Wilmington, Del., to promote an accident prevention campaign have been taken by safety engineers representing many of the largest industries in that vicinity. Further meetings are to be held. At the first gathering the Harlan plant of the Bethlehem Steel Co., American Car & Foundry Co., Pusey & Jones, E. I. duPont de Nemours Co., Atlas Powder Co., Hercules Powder Co., Joseph Bancroft & Sons Co. and the Liberty Mutual Insurance Co. were represented. L. A. DeBlois, safety engineer of the duPont Co., presided.

The British Board of Trade, according to Vice-Consul Leslie E. Reed at London, has published an important series of official instructions to surveyors of vessels, dealing with the extent to which repairs may be made on the boilers of passenger steamers by the electric or oxy-acetylene processes. These instructions are of particular interest to the United States, where great progress has been made in this method of welding.

Plan to Improve Foreign Trade Statistics

Government Officials Invite Criticism of Tentative Classification of Iron and Steel Products to Be Used in Reporting Exports and Imports

The war as well as the growth of our foreign trade has made evident the need of more detailed and better arranged statistics of imports and exports from the point of view of both the Government and private business men. In accordance with this purpose, a new classification of commerce commodities is now being made by a committee composed of representatives from the Bureau of Foreign and Domestic Commerce, the Census of Manufactures, the Treasury, the Shipping Board, the Tariff Commission and the War Trade Board. This committee is making every effort to work out a classification that will enhance the value of the statistics and to give as much detail as is possible under the practical limitations of publication. To this end the advice of the trade is being sought, in order to insure a practical and serviceable list of commodities to be reported in the monthly and annual summaries of our foreign trade, as issued by the Department of Commerce.

Although the classification is made primarily for statistics of imports and exports, it is expected that it may be used in other statistical studies, such as the statistics of domestic production, as made by the census of manufactures. The same classification will be used for both imports and exports, although there is provision under the scheme for showing details of imports separately where there is no need of going into the detail for exports, as, for example, in the case of certain tariff provisions.

The proposed classification is based upon a decimal system, which should greatly facilitate the collection and tabulation of the statistics by the use of mechanical tabulating machines, and also give elasticity to the classification, allowing additions or eliminations of items as trade conditions change.

In order to show the general scheme of the whole classification, the 10 main groups and the first subdivisions are given below, and the detailed classification of the iron, steel, non-ferrous metals and machinery groups.

The subdivision in the classification is carried to five figures. Individual commodities may either be listed in a "four figure" class or in a "five figure" class, depending on their relative importance, or as to whether the item is wanted only for our import trade returns. Space is provided in the classification so that commodities can be transferred from the five to the four figure classification or vice versa as trade warrants, without interfering with the comparability of the statistics from year to year. A commodity given a "five figure" classification will appear only in the table of "Imports for Consumption" as published by the Bureau of Foreign and Domestic Commerce. The details for the "five figure" headings will not be asked for exports. The "four figure" items will be given for imports as well as for exports, except where the imports are insignificant.

The detailed classification of iron and steel and machinery here given is strictly provisional and is published for the purpose of obtaining constructive criticisms and suggestions from the iron and steel manufacturers, importers and exporters of the country. Certain items may be omitted and others added. It will, of course, be impossible to give specific mention to all items, but, by a wise grouping and by a selection of items that are of first importance in helping us to follow the trend of our iron and steel trade, it is hoped that the new classification may be made of real service to the trade. For this reason individuals and firms are asked to constructively criticize the classification, both as to method of classifying and as to detail included under each heading.

Any suggestions will be given careful consideration and should be submitted at once. Communications should be addressed to the chairman of the committee, G. B. Roorbach, Room 714, Munsey Building, Washington.

Classification of Commodities

For Use in Foreign Trade Statistics

Main Groupings

0. Vegetable products principally foods; and beverages
1. Animals and animal products (except fibers)
2. Fibers and textile products
3. Wood, wood products, and paper
   - 30 Timber: Logs, hewn and sawed timber, etc.
   - 31 Lumber: Lumber, lath, shingles and veneers
   - 32 Manufactures of wood
   - 36 Paper base stocks
   - 37 Paper and paper products
   - 38 Books and all printed matter
4. Plant products, other than foods, fibers and woods
5. Non-metallic minerals and products
6. Ores, metals and metal manufactures
   - 60 Iron and steel ores and crude or semi-crude forms
   - 61 Iron and steel, manufactures of, except machinery and vehicles
   - 62 Manganese, chrominum, vanadium, tungsten, molybdenum, and other ferro-alloying and their ores
   - 63 Aluminum, tin and antimony
   - 64 Nickel, cobalt, bismuth and cadmium
   - 65 Lead and zinc
   - 66 Copper
   - 67 Brass and bronze and all other alloys of metals, n.e.s.
   - 68 Precious metals and manufactures of, including jewelry
   - 69 Mercury and all other metals, n.e.s.
7. Machinery and vehicles
   - 71 Vehicles
   - 72 Power generating machinery (except electric) (engines, boilers, water wheels, wind mills, parts and supplies)
   - 73 Farm and dairy machinery, appliances and parts
   - 74 Metal working machinery (machine tools, other metal-working machinery and appliances and parts)
   - 75 Mining, excavating and road machinery
   - 76 Pumps, compressing machinery, elevating machinery
   - 77 Factory machinery
   - 78 Electrical machinery and appliances and supplies
   - 79 Machinery, n.e.s.
8. Chemicals and chemical products
9. Miscellaneous

Iron and Steel

60 } Iron and steel; ores, crude, semi-finished, and manufac-
61 } tures of, except machines and vehicles

- 600 Iron ore
  - 6001 Iron ore, crude, hematite, magnetite and carbonate
    (For ferromanganese ore, ferrochrome ore, etc., see under manganese, chromium, etc., 62 and 63)
  - 6009 Iron ore n.e.s.
    - 60091 Calcined, roasted or treated ores
    - 60092 Pyrite sinter
- 601 Pig iron and scrap iron and steel
  - 6010 Pig iron used for iron content
    - 60100 Pig, n.e.s. (This includes basic pig, Bessemer pig (0.04 per cent or more phosphorus), low phosphorus pig (below 0.04 per cent), foundry pig (high silica), malleable iron pig, forge or mill pig, kentledge, and all other pig, n.e.s. used for iron content)
    - 60101 Ferrosilicon
      (For other iron alloy pig see under manganese, chromium, vanadium, nickel, etc., 62 and 63)
  - 6011 Scrap iron and steel
- 602 Steel; crude and semi-finished (includes ingots,

blooms, billets, slabs, sheet bars and tin plate bar)
6021 Bessemer and open-hearth
60211 Not containing alloys
60212 Containing alloys
6022 Crucible
(For crucible plate steel, see 6040)
6023 Electric
6024 Steel sheet bars and tin plate bar
60241 Not containing alloys
60242 Containing alloys
6029 Crude or semi-finished steel, n.e.s.
60291 Not containing alloys
60292 Containing alloys
603 Iron and steel; bars and rods
6031 Steel bars (merchant bars, reinforced concrete bars, mill shafting and all other steel bars, except sheet bar and tin plate bar, 6024)
60311 Bessemer or open-hearth, not containing alloys
60312 Bessemer or open-hearth, containing alloys
60313 Crucible, with or without alloys
60314 Electric, with or without alloys
6032 Iron bars, including iron merchant bars of all kinds
60321 Bar iron
60322 Muck bars
60323 Bars of rolled or hammered iron and round iron in coils or rods
60329 Iron bars, n.e.s.
6033 Rods, iron or steel
60331 Wire rods (rivet, screw, fence, nail, and other iron or steel wire rods, including flat rods, up to 6 in., ready to be drawn or rolled into wire)
60332 Cold rolled, cold drawn, cold hammered or polished
60333 Rolled wire rods, in coils or bars, if made by crucible, electric or cementation process
60334 Horseshoe nail rod
60339 Rods, n.e.s. (includes spike and chain rods, bolt and nut rods, etc.)
604 Iron and steel; plates and sheets, skelp and strips—black, galvanized or tinned
6040 Iron and steel plates—black, galvanized or otherwise coated
60401 Crucible plate steel
60402 Saw plates
60406 Galvanized plates
60409 Boiler and other plate iron or steel
6041 Iron and steel sheets—black or common
60411 Plain
60412 Corrugated or crimped
60413 Polished, planished or glanced
6042 Galvanized iron or steel sheets, plain or corrugated
6043 Tin plate, terne plate and taggers tin
(For manufactures of tin plate, see 617)
6044 Skelp
6045 Cotton ties
6049 Hoops, bands and strips of iron or steel, n.e.s.
60491 Hoop, band or scroll iron or steel (including barrel hoops), black
60492 Hoop, band or scroll iron or steel—galvanized or otherwise coated
60493 Steel in strips and flat wires (not exceeding 5 in. in width nor thicker than No. 15 wire gage (dress steels, corset steels, corset clasps)
60494 Strips of iron or steel, black, n.s.p.f.
60495 Strips of iron or steel, galvanized, n.s.p.f.
(For ship and tank plates and other structural forms, fabricated, see 605)
605 Structural iron and steel, and pressed, sheared or stamped shapes, n.e.s.
6051 Plain structural shapes (beams, joists, angles, channels, car truck channels, TT columns and posts, deck and bulb beams, building forms, and all other structural shapes, not assembled or fabricated)
6052 Fabricated structural forms (bridges, buildings, ship framing, etc.)
6053 Ship and tank plates, punched and shaped
6054 Metal lath
6059 Pressed, sheared or stamped shapes, not advanced in manufacture beyond pressing, etc.
60591 Bessemer or open-hearth steel
60592 Crucible, electric or alloy steel
606 Rails and other railroad iron or steel
6061 Rails
6062 Rail joints and fastenings (splice bars, fish plates, tie plates, and other rail joint shapes)
6063 Switches, frogs and crossings
6064 Railroad spikes, bolts and nuts
607 Tubular products and fittings
6071 Seamless tubes
6072 Wrought iron or steel pipes and tubes—black (lapwelded, butt welded, seamed or jointed)
6073 Wrought iron or steel pipes and tubes, galvanized
6074 Casings and tubes for oil wells and other drilled wells (includes casing, drive pipe, tubing, rig pipe, boring tubes, etc.)
6075 Boiler tubes
6076 Wrought iron or steel pipe or tube fittings—threaded
6077 Cast-iron pipe and fittings
6079 Tubes, pipes, or fittings, n.e.s.
608 Wire and manufactures of
6081 Barbed wire
6082 Galvanized wire
60821 For fencing
60829 Galvanized, n.e.s.
6085 Wire, n.e.s.
60851 Round iron or steel, black
60852 Baling (free)
60859 All wire n.s.p.f.
6086 Wire fencing—galvanized
6087 Wire rope and cables
6089 Wire manufactures, n.e.s.
60891 Wire cloth and screen
60892 Woven wire bed springs
60893 Heddles or healds
60894 Wire insulated with rubber, cotton, silk or other fabric
60897 All wire products, n.s.p.f.
(For wire nails and staples see 618, for hooks and eyes see 699)
609 Castings and forgings, n.e.s.
6091 Gray iron castings, n.e.s.
6092 Malleable iron castings, n.e.s.
6093 Steel castings, n.e.s.
(This includes hammer molds, gun barrel molds, die blocks or blanks, etc.)
60931 Bessemer or open-hearth, without alloy
60932 Crucible, electric, or alloy steel
6094 Iron castings, n.e.s.
60941 Cast iron plates, stove plates and irons, sadirons, tailor irons, hatters' irons and castings and vessels wholly of cast iron
60942 Chiseled, drilled, machined or otherwise advanced, but not made into finished articles
60943 Hollow ware, coated, glazed or turned
(For cast iron pipe and fittings see 607)
6095 Steel shells and projectiles
6096 Carwheels, tires and axles
60961 Wheels, or parts of, with or without axles for railway purposes and steel tired wheels for railroads and railway tires or parts of, wholly or partly manufactured
60962 Axles, or parts of, axle blanks, n.s.p.f.
6099 Forgings, n.e.s., not machined, tooled or otherwise advanced
62 Ferroalloys and the ferroalloying minerals (includes manganese, chromium, tungsten, vanadium, molybdenum, and all ferroalloys and their ores, n.e.s.)
621 Manganese ores, metal, and alloys
6211 Manganese and ferromanganese ores
62111 Manganese ores
62112 Ferruginous manganese ore
6212 Ferromanganese
62121 Spiegeleisen (15% to 45% manganese)
62122 Ferromanganese (above 45%) and manganese metal
622 Chromium: ores, metal, and alloys
6221 Chrome ores
6222 Ferrochrome and chrome metal
623 Tungsten ores, metal and alloys
6231 Tungsten ores (wolframite, huebnerite, wolfenite, ferberite, stolzite, raspite, etc.)
6232 Ferrotungsten
6233 Tungsten metal (powder, wire and other forms)
629 Vanadium, molybdenum and other ferroalloys and their ores, n.e.s.
6291 Vanadium ores and alloys
62911 Vanadium ores (patronite, vanadinite, etc.)
62912 Vanadium alloys
6292 Molybdenum ores, metal and alloys
62921 Molybdenum ores
62922 Ferromolybdenum and molybdenum metal
6299 Ferroalloys and their ores, n.e.s.
62990 Ferroalloys, n.s.p.f. (ferroboron, ferro-

phosphorus, ferrouranium, ferrocerium, etc.)
62991 Titanium ores (itaenite rutile, etc.)
62992 Ferrotitanium and titanium metal
62993 Zirconium ores (badeleyite, etc.)
62994 Ferrozirconium
62995 Tantalum ores
62996 Ferrotantalum
(For chemical compounds of manganese, chromium and the other metals above see chemicals, 80)
611 Stoves and furnaces (except electric)
612 Steel furniture, filing devices, safes and similar office and store furnishings
613 Enameled, galvanized and tin ware
6131 Tin ware—table, kitchen, and hospital
6132 Tin cans
6133 Galvanized hollow or kitchen ware
6134 Bath tubs, enameled
6135 Lavatories and sinks, enameled
6139 Enamel ware, table, kitchen and hospital, n.e.s.
615 Nails, screws, bolts, nuts, washers, etc.
6151 Nails and spikes, wire, plain or galvanized
6152 Nails, horseshoe
6154 Nails, all other, including tacks
61341 Nails and spikes, cut (not including railroad spikes)
61342 Tacks, brads and sprigs, cut
61343 Nails and tacks (except railroad material, 605)
6155 Staples, wire
6156 Wood screws
6157 Machine screws
6159 Bolts, nuts, rivets and washers (except railroad)
61391 Bolts with or without threads or nuts, or bolt blanks, of iron or steel
61392 Nuts and nut blanks and washers
61393 Nutlocks, spiral and lock washers
61394 Rivets, studs and steel points, and rivets and studs for automobile tires
614 Cutlery and needles
615 Tools and implements (except machinery); agricultural
616 Tools and implements; wood working, metal work-
617 ing, constructors' and similar tools, n.e.s. (not including machine tools and knives)
6161 Axes
6162 Augers and bits
6163 Blacksmiths' tools and railroad tools, n.e.s.
61631 Tongs, hammers, sledges, truck tools, wedges, crowbars
61632 Anvils
6164 Drills and reamers
6165 Files and rasps, including blanks
6166 Hammers, hatchets, and adzes
6167 Nippers and pliers of all kinds
6168 Saws
61681 Circular saws
61682 Cross-cut saws
61683 Mill saws
61684 Pit and drag saws
61685 Steel band saws
61686 Hand, back and other saws, n.s.p.f.
6169 Wrenches
6171 Measuring tools (includes bevels, calipers and dividers, rules, squares, gages, speed indicators, test indicators)
6179 Tools, n.e.s. (except knives) (includes all tools, n.e.s. carpenters', machinists', stone cutters', plumbers', tinners', bakers', cobblers', except knives, which are classified under cutlery 6149)
618 Hardware, n.e.s., and all other manufacturings of
619 iron or steel, except machinery (7)

Frank D. Chase, Inc., industrial engineer, has moved from the Peoples Gas Building, Chicago, and now occupies an entire building at 645 North Michigan Boulevard, corner of Erie Street. Every year the corporation has been compelled to acquire additional space, and the renewed demand for larger quarters could not be supplied at the old location. It is an innovation for an engineering firm to occupy an entire building on North Michigan Avenue.

The Jones & Laughlin Steel Co. has made arrangements with Freyn, Brassert & Co., engineers, Chicago, for the installation of a Brassert gas washing and drying unit at No. 5 blast furnace, now building at its Aliquippa Works, Woodlawn, Pa.

EXPECT PROSPERITY

Canadians Look Forward to Period of Great Activity in Business

TORONTO, ONT., March 11.—Prospects for business in Canada are exceptionally bright. Present conditions point to a period of trade prosperity in the country which has never been surpassed in the history of the Dominion. So far as the iron and steel trade is concerned, there is enough business offering to keep all Canada's steel plants operating to capacity for upward of a year. Included in the Canadian Government's estimates of expenditure for the year is an item of $35,000,000 for steel rails, rolling stock and other railway equipment; more than $20,000,000 for extensions on the Canadian National Railway System and upward of $10,000,000 for railway betterments. In addition to these orders for rails and railway equipment, a number of foreign orders have been placed and additional contracts are assured. The Department of Trade and Commerce, Ottawa, has received inquiries from South Africa for agricultural and dairy implements, ammunition, asbestos sheets, bakers' supplies, bolts, box shooks, butchers' supplies, cans, cart and carriage material, electric material, electric irons, electric household appliances, engines, enamelware, hardware, iron and steel, kitchen utensils, lanterns, lead (white), locks, machines, sewing machines, metal windows, nuts (iron), and a number of other articles. In addition to these articles South Africa plans considerable railroad construction and will require locomotives, cars, rails, bolts, and other equipment.

Road-making machinery is expected to be in much larger demand during the coming season than it has been for several years. The large program of road construction that is being entered upon in different sections of the country promises to broaden this market considerably. Only a small percentage of the capacity of plants engaged in this line of manufacture is devoted to the production of such machinery, as it is felt that the Canadian market is too limited to provide great scope. An accession of activity in this department would be of great importance, and, judging from the prospective program already laid down, there will be considerable larger demands on manufacturers than in the past. Farm tractors and implements will also be in good demand. The Canadian farmer is to-day running his farm on a business basis, and on account of the shortage of farm labor is turning to labor saving machinery to offset this shortage. Representatives of the Irish Co-operative Agricultural Society, now in Ottawa, have concluded arrangements for the purchase of a large quantity of agricultural machinery. A large order was placed with the Frost & Wood Co., Smiths Falls, Ont., and will be put in hand at once. It is learned that other orders from the Co-operative Society, orders of considerable magnitude, will follow very shortly. The Amur Province of Siberia will require large supplies of agricultural machinery during the year 1919, including plows, cutters, disc harrows, seeders, mowers, rakes, binders, threshing machines, straw cutters, monkey wrenches, files, as well as parts for the above machines.

Preparing for the Next Loan

YOUNGSTOWN, OHIO, March 10.—Industrial organizations and banks in this city have subscribed for $7,669,000 certificates of indebtedness, issued in anticipation of the fifth Liberty loan. All plants are preparing for the next loan and there is much speculation as to its success among steel workers. During the war, they were heavy buyers and the per capita purchases were higher than those of employees in any other major industry. Deferred payment plans were offered by all the leading companies in the Mahoning valley. Payments on the last loan floated are still being made. The attitude of the foreigners on the next loan is anticipated with some anxiety as many are preparing to leave for their native countries.

SKILLED LABOR OFFICE

Opened in New York to Classify Accurately the Tradesman's Qualifications

To assist in bringing the skilled man and the "skilled" job together, the United States Employment Service, Department of Labor, has opened a demonstrating office at 1184 Broadway, New York. Here are being applied the latest methods of interviewing and placing skilled workers from the Army, Navy and war work plants, by attempting to match the man and the job.

Skilled mechanics and their helpers only are registered for placement. Only a technical interview is given to determine the degree of trade ability and skill actually possessed, allowing the prospective employer to pass upon the education, age, experience, physique and such auxiliary qualifications. The office has been divided into units, each of which is equipped for handling a certain allied group of tradesmen. A preliminary interviewer receives the applicant and directs him to the unit where his case may be most expeditiously handled.

A feature of the office of special interest to the employer is the introduction of the "description of occupations," or trade specifications prepared by the Governmental bureau of labor statistics, the object of which is to make specifications for labor uniform, and to inform the prospective employee of the exact nature of the work he will be expected to do. It is not known when an employer orders a machinist whether he means a machine hand, machine operator or tool maker. The so-called "descriptions" aim to eliminate the vagueness.

In temporary charge of this new service is H. A. Stevens, Boston, formerly district superintendent for the United States Employment Service for New England. He has been assisted by Storm V. Boyd, former trade test supervisor for the War Department with the committee on classification. The corps of examiners consists of William J. Coyne, Dr. J. C. Chapman, professor educational psychology, Western Reserve University, assisted by P. N. Golden, H. A. Toops and Lieutenant Sedgwick.

The new enterprise is the outgrowth of the work of the committee on classification of personnel in the Army, which gained time in the war emergency by sifting out soldier-civilians with trade experience and placing them where needed, thus eliminating months of valuable time in training inexperienced men. More than half the men in the Army must be skilled at special trades in order to perform their military duties.

A total of 714 occupations make up the Army's classification system. The Army trade specifications define each of these kinds of occupational skill and prevent misunderstanding of terms. The personnel officer brings the man and job together, thereby giving the Army the benefit of civilian experience gained at the soldier's expense, minimizing the need for Army schools to develop specialists out of raw material, shortening the training period of units, making the man contented because of continuation in his trade.

Over 100 trade tests had been developed and additional tests were being produced. There were three kinds of such tests: Oral, picture and performance. These classify men into four grades of skill: Novice, apprentice, journeyman and expert. Oral tests lasted 10 min., during which 17 questions were asked; in the picture tests photographs were presented of tools and equipment, which the interviewed had to define; in the performance test a certain operation had to be done in a certain period.

Eight steps were used in the making of a trade test. Full information was gathered from labor unions, employers, trade schools and trade literature. Then a set of tentative questions, or a tentative job embodying the essential features of the trade was prepared. The questions, or job, were tried out on a few tradesmen of different degrees of trade ability, then the test was revised in the light of the results of this trial. The test, as revised, was tried out on 20 men known to be experts, 20 journeymen, 20 apprentices and 20 novices. Answers to questions or jobs performed by the 80 men were analyzed to determine in which questions or features of the job experts did better than journeymen, journeymen better than apprentices, apprentices better than novices; also which combinations of questions, or which job, will more accurately separate experts from journeymen, etc. Then the finished trade test was prepared and sent to trade test stations in various camps. The information gathered from these camps was compiled pending future improvement of the test.

Relation of the Tin to the Iron on Tin Plate

The adhesion of the tin coating of tin plate to the iron, which has been dipped into the fused tin, is generally ascribed to the diffusion of the tin into the iron and to the formation of an alloy of the two metals. Proofs for the existence of this alloy have not been given, and Dr. Leo Mayer of Oberhausen, Germany, questions its existence in an article in *Stahl und Eisen*, Oct. 17, 1918.

He first experimented with a good commercial tin plate, from which he cut off strips. Polishing the edges of these strips for metallographic study, he found that the tin was torn out, developing holes and cracks. He therefore copper-plated the whole strip first, then polished it, and etched it with weak nitric acid, 2.5 per cent, using for further etching picric acid, which attacked the iron, but not the tin. He found no evidence of any diffusion, and he points out that modern tin-plating would hardly afford sufficient time for any such diffusion. Nor did he observe any action of the hot tin on the ferrite and pearlite in the iron. But the tin coating seemed to be sharply separated both from the copper and the iron by black lines—possibly marking gaps due to detached tin particles—and the thickness of the tin coating varied between 0.01 mm. and 0.002 mm.; the surface of the sheet metal may not have been plane or the rolls not perfect.

Dr. Mayer then made experiments with small blocks of three kinds of iron, a very pure electrolytic iron, an iron with 0.06 per cent of carbon, and an iron with 0.41 per cent of carbon, otherwise pure commercial metal. He cut these blocks from sheets polished them, etched them in hydrochloric acid, dried them in zinc chloride, and then plated them in tin baths at 300 deg., 500 deg., 750 deg., 950 deg. C. The baths were heated up quickly, the metal was kept in the bath for ½ hr. at steady temperature, and then cooled in the bath down to 300 deg., the final cooling being effected in the air. The three samples were in each case treated simultaneously.

He found that at 300 deg. the pearlite and ferrite remained unaffected, but an intermediate zone of a bluish crystalline mass began to develop between the tin and the iron. At 500 deg. this intermediate layer was thicker, and the pearlite seemed to be pushed down into the iron. These effects were more marked at 750 deg., while finally at 950 deg. no pure tin crystals were left, the whole coating being made up of a mixture of white and bluish particles. In the high-carbon steel the effects noticed at 750 deg. were already manifest at 500 deg.; with the purest iron the formation of small crystals within the larger ferrite crystals was observed near the tin coating.

After studying the three plates of excellent photographs illustrating the article in question, the translator and abstractor in the London *Iron and Coal Trades Review* does not exactly agree with Dr. Mayer that the intermediate layer of bluish crystals grew as the temperature was raised, but that more and more of the tin was transformed into the bluish mass; in other words, that the intermediate layer grew at the expense of the tin coating. There does not appear to be any indication of a diffusion of the tin into the iron; it looks rather like a diffusion of iron into tin, though the diffusion is probably mutual. The black separation lines between the layers always remained distinct. The research is at present incomplete owing to the war.

British-American Co-operation in Steel

A Proposed "Business Entente" That Shall Apply to Iron and Steel Exports—Reported Invitation for Conference in Great Britain

THE Brussels conference of July, 1911, at which iron and steel manufacturers from the United States, Great Britain, France, Belgium, Austria, Germany and other countries met at the call of President Gary of the American Iron and Steel Institute to consider the formation of an international steel trade association, is recalled by an editorial in the London *Iron and Coal Trades Review* of Feb. 14. The article says that an invitation was sent recently by the British steel makers to leaders in the industry in the United States to meet in Great Britain to discuss the making of an agreement that will insure to the manufacturers in both countries a fair profit from their export trade in steel products. Whatever informal expression may have been made on the subject, no communication has been received thus far by the American Iron and Steel Institute, which would naturally be the medium through which such an invitation would come, since it was the institute that promoted the Brussels conference of 1911. Below is given in full the London *Iron and Coal Trades Review* article, which is of special interest as reflecting the thought of British steel masters on the problems with which they must deal in their future export trade:

It is now some years since Judge Gary, chairman of the United States Steel Corporation, put forward, at the Brussels International Conference, his views on the subject of a world-wide agreement on sale prices for iron and steel. His standpoint—after the lapse of years it is only emphasized—was that iron and steel as a commodity should always yield a fair profit to the manufacturer, and that hundreds of thousands of tons had been sold abroad at a loss, when by an international arrangement prices could have been maintained at such a level as would yield this fair margin to the maker. Further, the technical management of a works would spend huge sums of money, and take infinite care and trouble in designing labor-saving appliances, to save 2s. 6d. a ton, which amount would promptly be thrown away by the selling side of the business.

These principles are undoubtedly eminently correct, but the difficulties of international agreement at that time were great. We had to deal with not only the American and British makers—the latter at the time with no central organization—but also with a series of Continental producers—German, Belgian, French, Russian, Italian and Spanish. The difficulties in the formation of a League of Nations in a political sense, which are so evident to-day, were much in evidence at that time in a commercial sense.

German Export Steel Not Now a Factor

As a result of war, however, matters have been profoundly changed. The Germans are very largely out of the export market; at any rate, while the blockade is continued their overseas trade is at a standstill, and the huge rail-borne market which existed to the east and to the north of them in Europe is in a state of chaos, and will take perhaps a long time to reconstruct. The Russians must build up a new state, while the other producing nations of Europe have years of reconstruction ahead, which will absorb their capacity, and probably leave them as importers rather than exporters.

In these circumstances there are at the moment only two nations mainly to consider, the American and ourselves. Surely, with the already existing ties strengthened by military alliance and mutual sacrifice, it should not be difficult to come to some understanding with the American iron and steel producers to enable both countries to live in the export markets of the world, and to insure a distribution of products such as will leave a fair margin of profit for the producer. It is a preliminary to such an arrangement that the manufacturers of both countries should be satisfied with a fair and legitimate share of the trade that is available, and in view of the successful arrangements which were carried on for so many years through the Railmakers' Association the hope may be expressed that an extension of these principles to other branches of the trade should be possible. The difficulties, of course, must not be underrated, but this much may be said—that political rivalries generally spring from trade rivalries, and if a political entente is possible, why not also a business entente?

A London Conference

In these circumstances it is satisfactory to hear that pourparlers have already been entered into, and an invitation has been sent by the British steel makers asking the Americans to send representatives over here in order to discuss matters. As a nation, perhaps, we are apt to underrate our capabilities, and it must not be assumed that from the competitive point of view the British iron and steel trades are in such a parlous condition as the present labor unrest and the high prices ruling might lead outsiders to suppose. The best-informed opinion seems to incline to the view that the present labor unrest is not really of a dangerous character, and it may be expected to gradually right itself in the course of, at the outside, a year or two.

Higher costs may be expected in both countries. Shortened hours of labor are not only a British movement; they are a world-wide one. The American iron and steel industry has already accepted a basic eight-hour day. Possibly an attempt will be made to regulate hours of labor at the Peace Conference. This is a difficult matter, but whether successful or not it is broadly true that the demands underlying the labor movement in this country are no less applicable to America and to Continental Europe than to ourselves.

Post-War Problems

Many other of our difficulties find their counterpart in the United States and abroad. For instance, take the railroads. A recent authority pointed out that the wages bill on the American railroads is £180,000,000 up since the war started, and in addition they are dealing with considerably less freight since the armistice. The computation was made that the American railroads, at present freight rates, are making a loss of £60,000,000 per annum. Further, of course, the American railroads suffer like our own from the equipment and physical condition of traffic facilities. The same remark, indeed, applies to American roads and highways and to the development of public utilities. The Americans, like us, must with the cessation of munition manufacture scrap an immense amount of machinery, while the sale of their surplus stores, undertaken under Government regulation, as in our own country, is likely to be a dis-

turbing factor. In America building operations other than those for immediate war needs have ceased for a long time, and the housing problem is becoming acute. In addition, in America immigration has practically ceased, and the seriousness of this situation can only be fully seen when it is stated that at the high tide of emigration to America, in the two years 1913-14 1,300,000 emigrants landed in America, of which it may be assumed that 900,000 to 1,000,000 were males of a workable age. Since the war a very serious deduction in the number of immigrants has taken place which loss is greatly increased by the return to the colors of many immigrants of the pre-war period. This will create a very great shortage of common labor in the mining, iron and steel and other industries, and it would appear that the chances of European emigration to America are less owing to the depletion of man-power by war losses and by the fact that higher wages and higher standards of living are likely to exist in European countries in the future.

British Handicaps

These factors all affect international competition. There are, however, two sides to the question. In America, as is generally known, the output per worker is much greater than here. In other words, the number of men employed is much less; consequently, assuming that wages were in both countries, say, permanently doubled, the result will be that in America they will pay double wages on, say, one man, whereas in this country we must pay double wages on, say, three men, which relatively will increase our costs. It is true that we have an advantage in that we have leeway to make up in the adoption of labor-saving machinery, and that by the use of such machinery we ought to be able to reduce the number of men employed to something like the American level, but this raises further difficult questions.

Practically the bulk of the American iron and steel works extensions have been made with steel at half its present price, whereas if extensions are to be made here forthwith they must be made at prices even in excess of those which were ruling during the war. This would mean so great a capital expenditure that it is very doubtful whether the game would be worth the candle. Under the operations of the Finance Act manufacturers are entitled to write off the difference between the war cost and post-war value of extensions which they have made, and it would seem that unless some such provision of this sort is continued that there will be a very grave hesitation in embarking upon the erection of new plant for some years to come.

This, however, is by the way. The possibilities and benefits accruing from an international understanding at the moment are more obvious than they have ever been. There is good reason to believe that Mr. Farrell and Mr. Clarke, and one or two other of the leaders of the American iron and steel export trades, are anxious for an interchange of opinions leading to this end, and it is to be hoped that before long iron and steel makers of both countries will get round a table and endeavor to discuss matters.

A Proposed Bureau of Welding

The American Welding Society is to be formed at a meeting at the Engineering Societies Building, New York, on March 28. The organization will constitute a merger of the welding committee of the Emergency Fleet Corporation and the National Welding Council, formed during the war. It is proposed to make the body a disinterested and dependable source of information on welding, not only for the benefit of the manufacturers of welding apparatus and supplies, but also to aid those who use welding in their production and those who purchase welded goods.

One of the main aims of the association is to unify the welding investigation work of existing societies through a proposed bureau of welding, which will be made up of a board of directors, one for each organization. Therefore, the American Welding Society is to be regarded as an agency for creating a common department of welding for various interested associations, rather than as an additional society. The organization will, it is hoped, give greater stability to welding by standardizing processes, and thus make economies available in a wider field of industry. Because of the large number of variables which affect the quality of a weld, even in the simplest welding processes, it is felt that there is a great opportunity for useful research work. It is, therefore, proposed that the new society initiate and conduct studies, such as the determination of the best current to use with various sizes of electrodes and different types of work in arc welding, and the proper method of procedure in making both gas and electric arc welds coupled with an adequate system of inspecting the work as it progresses.

Six different classes of memberships in the society are provided for in the tentative constitution: Class A with annual dues of $100 for companies manufacturing and selling apparatus for welding, employing welding as a process in their output, or purchasing welded goods; class B, dues $20, for employees of such firms, and for consulting engineers, college professors and others desiring individual memberships; class C, which gives to members of existing societies that become affiliated with the association in its studies, the privilege of becoming associate members at dues of $10; class D, for welding artisans, who do not desire full class B memberships, dues $5; class E, for trade associations; class F, honorary memberships.

Those unable to attend the first meeting will be entitled to charter memberships by writing the temporary headquarters, 33 West Thirty-ninth Street, New York, indicating the class to which they desire to be assigned.

Steel Foundry Operations at Chester, Pa.

Steel foundries in the Chester, Pa., district are operating at from 60 to 80 per cent of capacity, depending on the foundry. Those plants which make locomotive work almost exclusively are operating four or five days a week. This is also true of those making ship castings largely. Demand for anchors is heavy and is an important item in some cases. There has been an extensive cancellation of sets of castings for merchant ships. Navy work is progressing, but it is not enough to keep any foundry busy. Makers of small castings are fairly well occupied, but the entire situation is a decided contrast to the pronounced activity only six months ago.

The labor situation has changed in every respect. Molders, who left their regular work to take positions in shipbuilding and munition plants right in the Chester district are returning to their former occupations. The serious lack of skilled molders which existed a few months ago has given place to a more plentiful supply, a fact which is an important aid to a better product. This is also true of the general labor situation.

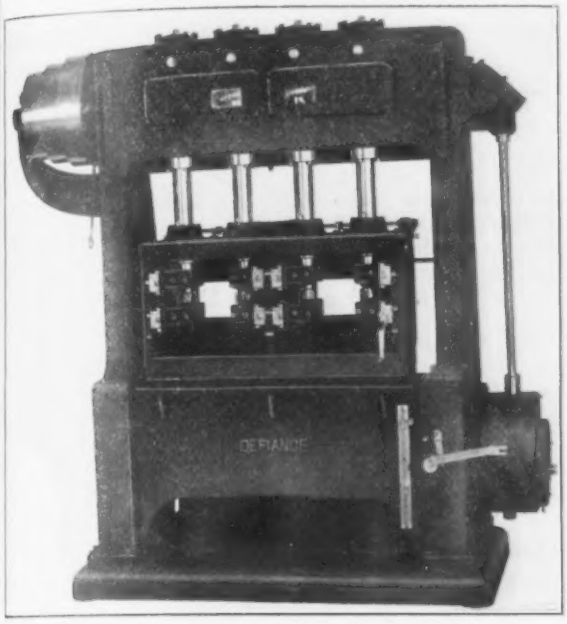
The Thurlow plant of the American Steel Foundries recently completed an order for the largest locomotive engine frames ever cast. Each one had an over-all length of 45 ft. and weighed over 22,000 lb. when shipped. It required about 40,000 lb. of metal to pour each casting and a flask about 52 ft. long.

At the plant of the Eagan-Rogers Steel & Iron Co., Crum Lynne, Pa., preparations are being made to operate a Stoughton oil-burning cupola with hot blast instead of cold. It is expected that this will result in a still lower consumption of coke than with the present installation at this plant where cold blast is used, and where the use of oil reduces the coke consumption to one-seventh the amount used in the coke fuel cupola.

The plant of the Federal Steel Foundry, Chester, is making a large assortment of stern posts, stems, rudders and other ship castings of basic steel.

Boring Machine for Gas Engine Cylinders

Cylinder boring machines of the type illustrated are being constructed by the Defiance Machine Works, Defiance, Ohio. They are designed as special single purpose production tools to meet gas engine manufacturers' requirements to rough bore, semi-finish, and finish bore gas engine cylinders of either single units or any number of units cast en bloc. After the jig and



Machine Designed and Built by Defiance Machine Works for Boring Gas Engine Cylinders, Either in Single Units or Cast En Bloc

tools on this machine have been set, the operator needs only to load and unload the cylinder castings, as the balance of the operations are accomplished automatically.

The oiling is by a force feed and splash system combined, made possible by the all-inclosed feature of the machine. Both the feed and drive mechanisms are tightly incased and partially submerged in a bath of oil, while the bearings are lubricated through individual leads by a force-feed. Unit construction of the various mechanisms is followed throughout, and each unit is accessible without disturbing mechanism other than that retained in a single unit.

The drive to the spindle is transmitted from a three step cone pulley through steel worms and bronze worm gears, but, in place of driving the spindles through the worm gears by means of keys, a large tongue drive is cut integral to the spindle and the worm gear is cut to mesh. The purpose of this construction, it is pointed out, is to effect a smooth and powerful drive, to reduce torque to a minimum, and to eliminate chatter in the cutting tool. The spindles are each supported by three bronze bearings. The nose bearing is conical shape, and has an adjustment for taking up wear. Each spindle floats between two sets of large ball-thrust bearings which receive all end thrusts. The momentum of the spindles can be instantly arrested, after the power has been taken off, by means of a friction brake operated by a lever located in reach of the operator.

The feed mechanism is of unit construction, tightly incased, and retains a sufficient level of oil to effect a splash system of lubrication. All feed shaft bearings are bronze bushed, of which the end thrusts are taken by ball bearings. Feed changes can be made by removing a gear case cover and changing two gears. A hand adjustment for the table is provided, but when the machine is in operation the table automatically feeds the work to the boring tools, and when through the cut it automatically reverses to a fast travel, returns to its loading position and stops.

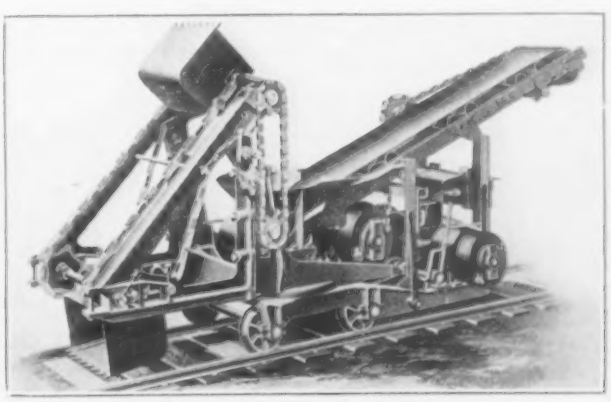
The jack screws, which raise and lower the table, are each retained in a jack and actuated by a heavy worm and worm gear through a bronze nut which is sleeved to the worm gear. Each jack is a unit in itself, with its contents packed in grease. A means for advancing or retarding the screws independently is provided to maintain alignment of the table. The advantage of the jack screw feed, which is located directly underneath the work, lies, it is claimed, in obtaining an absolute vertical feed thrust, thereby eliminating side thrust to the table, an important factor in securing work bored round diametrically and in absolute vertical alignment. The base of the machine rests on the floor at three points only, which eliminates the necessity of a concrete foundation.

These machines are built in three sizes, with 36 in., 48 in., and 60 in. between housings.

Continuous Twin-Scoop Loader

After several years of development work, the Wellman-Seaver-Morgan Co., Cleveland, has placed upon the market a mine loading machine known as the McDermott continuous twin-scoop loader. As its name implies, this machine digs loose ore, dirt or muck by a continuous scooping process, the material being taken up by scoops or buckets on an endless chain, elevated and dropped into a hopper which feeds to a conveyor belt loading into a car. The scooping mechanism is so pivoted that it can dig to the side as well as in front of the machine. The ore, however, being delivered to the conveyor through the hopper, reaches the car behind the loader no matter at what angle the scoop is working. The movement of the scoops is continuous, not reciprocating.

The machine is self propelled and is designed for the adverse conditions and restricted space incident to underground mining. The parts, it is stated, can readily be dismounted and reassembled, a desirable feature in getting the machine under ground, and in shifting from level to level. The levers for operating the loader are located at one side in a position convenient for the operator to see the several movements. Motors wound for 230 volts, direct current, provide power for all operations. The motors are of the entirely enclosed type



A Continuous Twin-Scoop Loader for Mines. The maximum rated capacity with full buckets is given as 1.75 tons per min., and the average capacity, 45 tons per hr.

and all chains and gears are protected with suitable guards.

While specially designed for underground work, the loader is not limited to this application as it can also be used on the surface for loading coal from piles to cars, removing piles of rock and sand and similar operations.

Joseph N. Smith & Co., manufacturers of automobile body hardware, East Grand Boulevard and Dubois Street, Detroit, have presented their employees with life insurance policies under the following arrangements: All in the service of the company over 30 days consecutively and not over one year, $500; over one year and not over five years continuous service, $1,000; over five years and not over 10 years, $1,500; over 10 years, $2,000. There is no cost to the employee during his service with the company. Beginning March 3 the company has reduced its working week from a 55-hr. to a 52-hr. week without any reduction in pay, about a 6 per cent increase in rates of pay.

POLAND TO BUY IN AMERICA

Establishes Commercial Agency — Credit Arrangements — Need of Farm Machinery

Poland is the first of the newly-born states to establish in the United States an equipped commercial bureau for the development of trade relations between the two countries. The Polish National Department at Chicago, of which I. J. Paderewski, premier of Poland, is honorary president, and which comprises an executive council of the Polish societies in the United States, has opened a Commercial and Industrial Bureau in the Æolian Building, 32 West Forty-second Street, New York City. This bureau will endeavor to furnish American manufacturers and exporters with detailed data relative to the needs of Poland and later to arrange loans and credits to meet the purchases.

George Fudakowski, E. E., for many years an executive with the Westinghouse Electric Co. in Paris, Warsaw and Petrograd and recently associated with Mr. Paderewski in the relief work for Poland in the United States, has been named director of the bureau. Through his organization he is in official contact with Polish authorities in Paris, London and Warsaw. Explaining the work of this new organization, Mr. Fudakowski said:

The purpose of the Commercial and Industrial Bureau is to formulate plans for the development of commerce between Poland and the United States. Poland has a present tremendously vital need of agricultural implements of every variety. Poland's official representation in Paris has presented to the Economic Commission of the Allies a proposal for the construction of 2000 miles of railways, particularly in what was formerly Russian Poland. These railroads are to be financed by loans from the Allied governments, which it is hoped will be secured by bonds of the Polish Government and by securities which will be hypothecated by Polish residents in the United States and other countries.

Arrangements are now being made in Paris by representatives of the Polish Government for the establishment of branches by United States banks in Warsaw, Cracow, Lvov, Posen and Lodz. The establishment of these banks will not only furnish American business interests with quick and favorable banking facilities, but will also be powerful mediums in destroying the hold which the German banks have always maintained in both Prussian and Russian Poland. Another and probably more vital accomplishment of these banks will be in handling the large sums of money, which until the outbreak of the war were normally sent from the United States to Poland by Polish immigrants to this country.

Statistics show that an average of $15,000,000 annually was forwarded from the United States to Poland by Polish immigrants until 1914. This entirely ceased when war began. As a result it is estimated that the Poles in America numbering over 4,000,000 have available more than $60,000,000 which can be either sent to Poland or can be deposited here as a credit with which to help establish Poland's needed monetary value.

Until the outbreak of the war, Poland's annual industrial output was valued at over $1,000,000,000 and industries employed 900,000 working men. These vast industries of textiles, foods, metals, mines, garment-making, paper-making and printing have been practically denuded of their machinery by the Germans. They now have immediate necessity for machinery of every description, especially textiles and mining machinery, also belting. Poland has also immediate need of large supplies of shoes, soap, cheap ready-made clothing, cotton and woolen goods, thread, hardware, agricultural tractors (as horses are very scarce everywhere in Europe) and all kinds of machines, implements, tools, lumber machinery, artificial fertilizer, seeds and livestock.

These goods are necessary at once as an emergency measure and the Polish National Department, realizing that the United States is the only country which, with its enormous industries and tremendous resources, can meet such large needs almost immediately, has established this bureau to organize the proper resources for prompt action. Arrangements are now being discussed for the allotment of tonnage to Poland and it is expected that the American Government will facilitate matters for official orders of this kind.

First and foremost, the bureau of this organization will facilitate the purchase and shipment of the necessaries of life, such as food and clothing. While this is being accomplished, arrangements for the shipment of other materials will be made. Figures thoroughly compiled indicate that the approximate quantities of agricultural machinery critically needed to restore Poland's agricultural life are as follows:

Fifteen hundred tractors, 150,000 light plows, 3000 iron and 15,000 wooden harrows, 500 disk rollers, 1000 motor, 1000 horse and 1000 hand-operation sowers, 3000 cultivators, dusters, rakes and diggers, 6000 hay mowers, 150 motor- and 900 hand-driven hay baling machines, 6000 ordinary harvesters, 3000 binders, 750 steam-driven, 1500 gasoline-driven and 3000 horse-driven threshers, 3000 separators and blowers, also metal parts for the construction of 3000 additional blowers, to be made in Poland, 1000 corn graders, 300,000 scythes, 450,000 sickles, 300,000 whetstones. Small tools: 300,000 hoes, 150,000 picks, 300,000 shovels, 300,000 spades, 150,000 axes, 50,000 mattocks, of various sizes and without handles, 300,000 wagons and ready-made wheels for 30,000 wagons, 90,000 sprays, 15,000 bellows, 18,000 axes, 300 55-in., 3000 60-in. and 3000 smaller handsaws, 1200 doz. files, 1500 doz. rasps, 1500 4-lb. spike hammers, 1500 8-lb. hammers, 3000 picks, 400 shovels, 900 spades, 900 hoes, 600 chains, 150 large chains.

Paper Pipes and Insulators Used by Germans

Americans are showing interest in a German war product, "pertinax," a compressed paper material, which appears to have had a double usage: as a substitute for iron, lead and copper pipes; and as a substitute for porcelain or mica for insulators. The word is coined from the Latin. (Per—through; tinax—to hold.)

The pipes are made by impregnating sheets of paper with synthetic resin, and rolling them around a mandrel of the desired dimensions until the proper thickness is secured. Heat and pressure are maintained meanwhile until a hard product is obtained. Formerly natural resins were used, but the introduction of the synthetic variety has raised the temperature of softening to above 180 deg. C.

Difference of opinion seems to exist as to the effects of water upon the material. Though one writer claims that it is insoluble and waterproof, another states: "Their absorption of water makes their use inadvisable for that liquid, but they gave excellent results when used to carry oil, a fact which is explained by the well-known resistance of synthetic resins to oils." There is no record of their being used successfully for water pipes, though they were practical for carrying gas and oil.

Experiments showed that pertinax pipes could bear interior pressure three to four times as great as that of lead pipes, while the weight is less than a ninth that of lead. A series of tests made at the Royal Institute for Testing Materials showed that they are not fitted for construction uses, since, while their resistance to tension is sufficient, their resistance to compression and their elasticity are both too feeble. The tensile strength is 14,250 lb. per sq. in. It is able to be worked similarly to wood, being turned, stamped, sawed out and drilled.

The insulator qualities of pertinax are due to its structure in layers, similar to that of mica. Being free from chemical action, it is also offered as a good substitute for porcelain.

Sakchi, the site of the Tata Iron & Steel Works, has been renamed Jamshedpur by the Government of India, in commemoration of the founder, Jamsetji N. Tata. The postal address will be The Tata Iron & Steel Works, Jamshedpur, via Kalimati, B. N. Ry., India.

Economical Motor Transport*

An Experience in Truck Operation Typical of Large Scale Organizations Employing Them in Freight Haulage

A BUSINESS with a fleet of 60 motor vehicles discovers that the motor transport is far below the standard of efficiency maintained in its manufacturing and distribution. Distinctly there is a motor transport problem—or seems to be, for accidental comparison of two sheets of cost figures arouses a suspicion as to the efficiency of one section of the motor transport, at least. But it is found that records do not furnish a basis for thorough analysis, because they are incomplete.

At this point the company's motor transport problem was submitted to experienced transportation engineers, with a request for investigation and suggestions.

And here is what the engineers learned:

The motor equipment is operated in two widely separated cities. In each city the company has good garage facilities and in both places a system of cost records had been developed independently of the other.

It was also found that rule-of-thumb methods had been largely followed in keeping track of gasoline, oil and the like. A clerk intrusted with recording these items would perhaps ask a driver how many miles he made to 1 gal. of gasoline, and if the driver replied, "About two miles," the busy clerk in good faith said, "Well, you had 20 gal. of gasoline to-day, Jim, so you must have run about 40 miles." And 40 miles would probably be entered on the records as the performance of that truck that day!

Among the sixty-odd drivers there was a wide range of ability. Records did not reveal the incompetent man, nor furnish a basis upon which to overcome his shortcomings by instruction, or by directing his attention to important factors of operation. Nor was it possible to discover the most efficient drivers and make their methods available to others. Real injustice was often done drivers, because they could not be given credit for skill, carefulness, economies of fuel and supplies, and other praiseworthy service to the company.

Engineers began by ascertaining the kinds of qualities of material to be hauled by motor, and made a study of the territory to be covered with reference to distances, systematic routing, character of pavements and roads, branch distributing points, facilities for quick loading and unloading at freight terminals, customers' premises, etc.

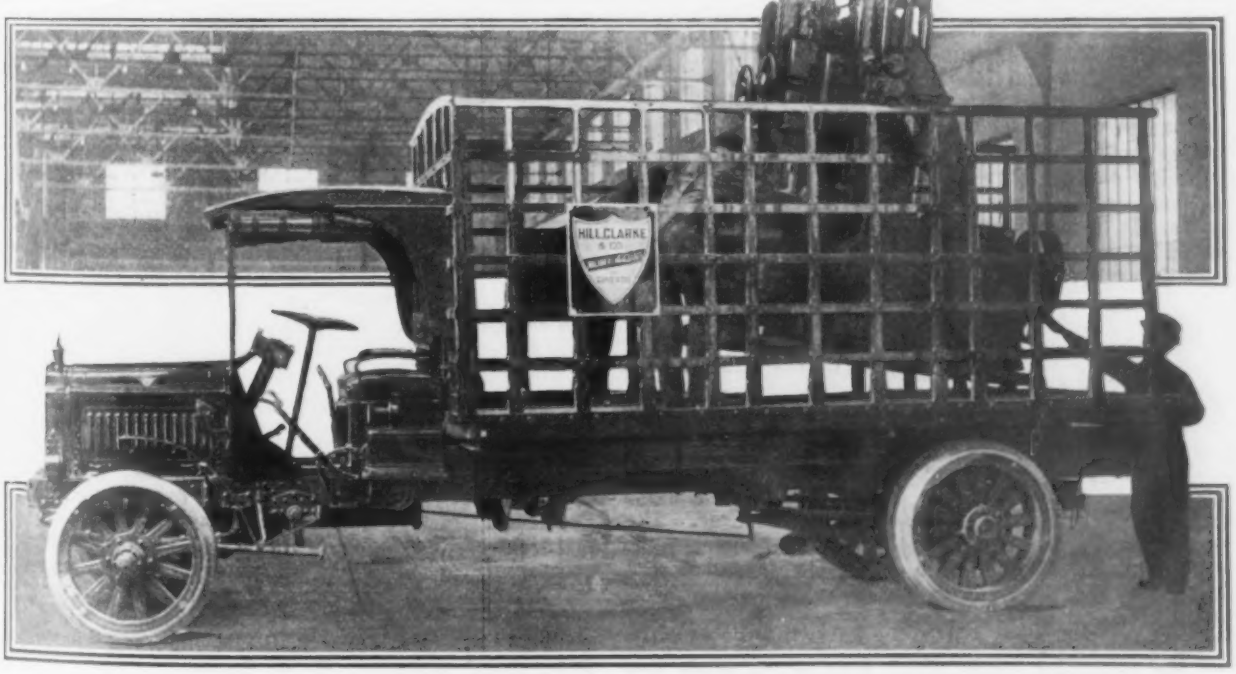
Then followed an inventory of motor equipment in use—make, type, capacity, age, conditions, kinds of bodies, and general suitability and to service requirements. This included a study of idle equipment during slack periods, and a maximum use of motors during busy periods, with investigation of outside trucking service required in busy seasons.

With this ground work of ascertained fact, engineers were then assigned to ride routes with drivers, keeping accurate route records of gasoline, oil and supplies, mileage, time spent on each trip, time of loading and unloading, time lost by delays of every kind, whether due to mechanical mishaps or outside causes, such as waiting at terminals or customers' premises.

This route riding made it possible to clearly visualize the general transport situation. Route records were worked out in terms of cost and hours, with almost startling discrepancies revealed in actual ton-mile values between two vehicles which had been credited with identical performance.

It was found that, because garage superintendents had no trustworthy figures of cost for vehicles of various types and capacities, that freight hauling and delivery service were not clearly separated, and vehicles of widely different character were used indiscriminately for all classes of service.

Route riding on a heavy truck might reveal the fact that it was subjected to too many stops and waits, by reason of the kind of freight carried. Lighter vehicles were used in hauling solid loads over direct routes when they should have been assigned to mixed loads



Direct Loading from the Shop Floor to the Truck Eliminates Costly Rehandling Charges and Delays

*From a copyrighted article by the Transportation Engineering Department, Packard Motor Car Co., Detroit, Mich.

with many stops to relieve large trucks of peddling.

Opportunities were also found to get drivers' viewpoints on important matters, such as causes of delay at terminals, mechanical mishaps to equipment, the efficiency and dependability of different motors, the convenience of bodies and loading and unloading devices, their feeling toward the company, their interest in efficient operation, and so forth.

As an upshot of this investigation the company is now using the National Standard Cost System adopted by the Truck Owners' Conference, which is recognized as fully covering every essential point of motor transportation cost.

Furthermore, it now recognizes the difference between motor trucks as an important auxiliary service, tacked loosely to the outside of its business, so to speak, and real motor transportation as incorporated into the business, taking its place as part of the whole process of production.

Taking this view, motor transportation is machinery. It eliminates hand labor, boosts up output, reduces cost. It demands study as machinery. It demands scientific management, as well as cost keeping. It is an intimate part of the industrial equipment and the factory process, and should be so regarded. Only on that basis will it yield maximum production, and any other basis of operation is unfair, both to the motor equipment and the business itself.

In delivery and hauling by horse and wagon, the equipment was looked upon as an auxiliary—if not a necessary evil. Investment in a horse and wagon was small compared with the motor truck. The average motor truck represents an investment of at least $3,000 while a horse will cost about $350 and a wagon about $500. Motor trucks operated by the business concern whose experience was dealt with above, cost upon the average $6,000 each.

When motor vehicles were substituted for horse equipment the owner persisted in regarding them upon much the same basis—as auxiliaries of the business instead of costly, high capacity machinery of an entirely new type. A 5-ton motor truck will travel, on the average, 50 to 60 miles a day, carrying from three to four times the load of a horse truck.

In other words, it is modern high power equipment, and requires an entirely different viewpoint.

A Quick Method of Coping Steel Beams

Oxyacetylene Cutting Substituted for Machining—Handling Reduced to a Minimum

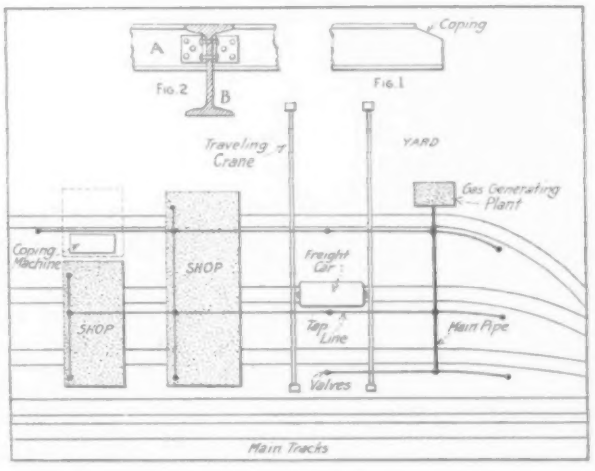
BY FRANK W. HARTH*

A NEW steel beam coping method, as employed by a large Pittsburgh structural concern, is not alone interesting, but also economical. Its practical value will be appreciated particularly by those engaged in the steel fabricating business. When a steel beam is cut away at the end, as illustrated, the work involved is called coping. This cut is made to permit a joint being made between beams and a flange riveted on.

The old method of coping steel beams is very expensive, involving considerable time and labor, the cost averaging $5 per ton, beam weight. A very heavy machine, costing perhaps several thousand dollars, is used for the work. It is sometimes located in a building by itself,the motive power being hydraulic. As the machine is stationary, the work must be brought to it. When a beam is to be coped, it must be loaded on flat car at the shop or stock yard and brought to the machine, then unloaded and the cut made. It is then loaded on the car again and perhaps, in turn, unloaded and reloaded on a standard freight car.

The oxyacetylene flame is used in this advanced method of coping. The use of the oxyacetylene flame is very efficient, being a time and labor saver. The work need not be moved in performing the operation, as the cut can be made wherever the stock may be, whether in the shop or in the yard. A good many of the beams are coped right on the freight car just prior to shipment. The cost of coping by the acetylene torch, which involves so much less labor and handling, is rarely more than $1 per ton, beam weight, or just 20 per cent of the cost of machine coping.

In order to make it possible to employ the gas flame at any point in a fabricating plant, a pipe line is run underground with tap lines radiating from it. The gas is supplied from a central station and piped to the various points where required most. Upright pipes are connected to the tap lines at these points. Valves are then extended about two feet above the ground. The operator can carry his torch from one place to another and simply plug in and begin work without any delay.



A diagrammatic layout of a plant equipped with a pipe line to replace the old coping machine is shown in the accompanying plan. A study of this will show the advantage of bringing the cutter to the work, over that of bringing the work to the cutter. It will be noted that the valves are located in the shop so that the coping can be performed before the beam leaves the building. The valves are also located along the spur track, at regular intervals, so that a beam is always accessible no matter where the car happens to be. Tap lines are also run out into the yard so that the coping can be done there also, whenever the occasion arises, particularly if there is congestion of stock in the building or on the tracks.

*1283 Morris Avenue, New York.

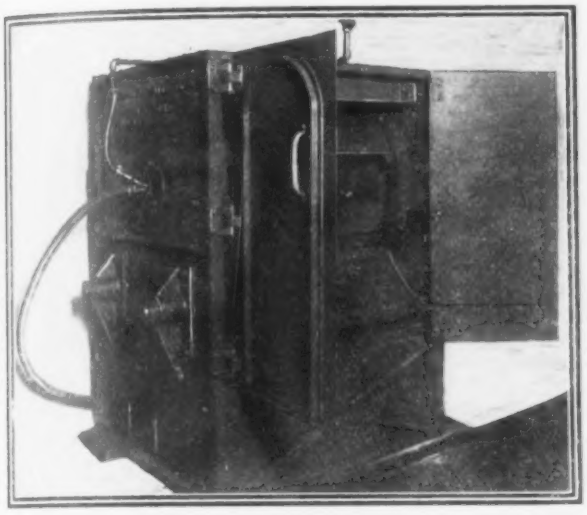
The Standard Shop Equipment Co. has been incorporated for $50,000, all treasury stock, the incorporators being H. Cadwallader, Jr., formerly engineer Continental Motors Co.; T. S. Ingham, formerly superintendent of Remington Arms Co.; M. H. Sarben, formerly treasurer Littlefield Corporation. The company will manufacture a number of patented set up appliances for machine tools. The officers are: H. Cadwallader, Jr., president; T. S. Ingham, vice-president and general manager; M. H. Sarben, secretary-treasurer. The company is contracting for the manufacture of its products, and is desirous of securing various kinds of catalogs for shop machinery and cold rolled steel.

The American Rolling Mill Co., Middletown, Ohio, has opened a Philadelphia sales office at 317 Widener Building, with W. S. Stepheneon in charge as district sales agent.

Sand Blast Tumbling Barrel

A small-sized self-contained sand blast tumbling barrel, which does not require a special setting but can be placed anywhere in the shop, and for which a growing demand is reported, has been brought out by the American Foundry Equipment Co., Cleveland. The only connections necessary in the use of this machine are the air pipe and the dust collector pipe. This is a 30 x 36-in. tumbling barrel of the suction type, its mechanical construction being very similar to the company's sand blast tumbling barrels of the pressure type, the principal difference being in the adoption of the suction principle in delivering the sand.

The barrel consists of a ⅜-in. rolled perforated steel plate drum with heavy cast-iron ends, rotating on



Small Size Sand Blast Tumbling Barrel of Suction Type

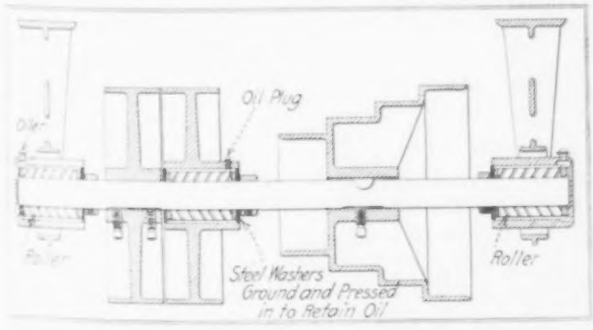
four chilled trunnions and driven by spur reduction gears, so arranged that it may be belted directly to a motor or jack shaft without intermediate gearing. The cleaning is done entirely by sand blasting, and the purpose of the tumbling is to expose all surfaces of the parts to the action of the blast.

Below the barrel proper is a perforated steel screen which retains foreign matter as the sand falls through it into the hopper. The sand is then drawn by suction into the nozzles located at either end of the barrel. The action of each nozzle is independent of the other.

The machine is said to be especially adapted for cleaning small work where the tonnage is not heavy, and in plants where it is desired to give the castings an additional cleaning before they are machined.

Shaper Countershaft with Roller Bearings

The Queen City Machine Tool Co., Cincinnati, announces that on all shaping machines manufactured after March 1, countershafts will be fully equipped with Hyatt roller bearings. This is the last of a list of improvements mapped out by this company, carried out

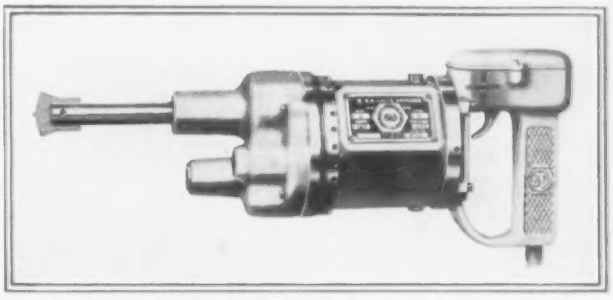


Countershaft Fully Equipped with Roller Bearings

under war-time conditions, "in an endeavor to make shaping machines most efficient for peace time reconstruction."

Electric Valve Grinder

A valve grinder with an oscillating spindle operated by an electric motor is being marketed by the Black & Decker Mfg. Co., Baltimore, Md. The movement of the



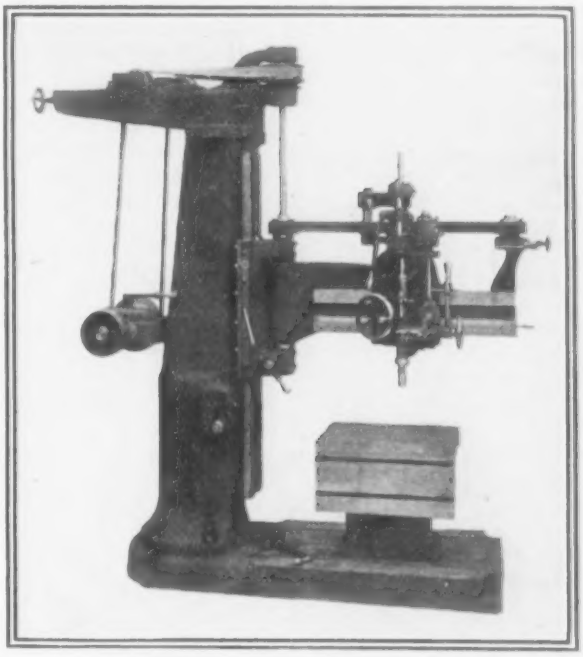
This Valve Grinder Is Operated by an Electric Motor. The spindle oscillates with a long steady sweep similar to the movement obtained in grinding by hand

spindle is similar to that obtained in grinding by hand. A pistol grip and trigger switch make for convenience in operating and controlling the grinder. The motor is of 1/6 hp., air cooled, for alternating current of 25 to 60 cycles, or direct current, and for 32, 110 or 220 volts.

The housing is of aluminum, with the gearing and oscillating movement separated from the motor compartment and packed in grease. The grinding spindle runs in a ball thrust bearing, and the armature shaft on ball bearings. The gear shafts are supported at both ends in phosphor bronze bushings. Bits to adapt the tool to various types of valves are provided.

Sensitive Radial Drilling Machine

A sensitive radial drilling machine, which has several new features, has recently been added by the Cin-



Sensitive Radial Drilling Machine with a Drilling Capacity of 29/32 In. It is equipped with ball bearings and with a tapping attachment

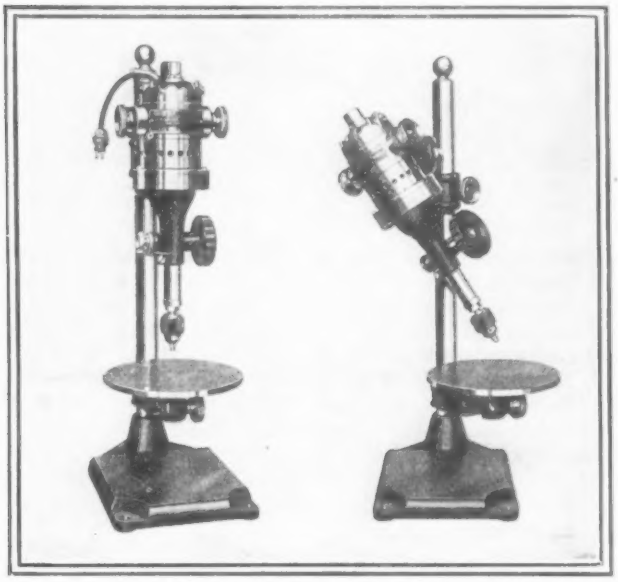
cinnati Pulley Machinery Co., Cincinnati, to its line of drilling machines.

The machine has ball bearings throughout and is built regularly with a plain hand feed and tapping attachment. However, power feed can be supplied when desired. The spindle has a vertical rack feed of 8 in. with a No. 2 Morse taper in the nose, giving a drilling capacity of 29/32 in.

The machine illustrated has a 2½-ft. arm and takes 48 in. under the spindle. Six spindle speeds are obtained within the range of 1.25 to 10, three through the open belt and three through the back gears on the countershaft of the machine. Four rates of feeds are furnished on the power feed machine.

Electrically Driven Drills

The Arnold line of portable precision tools illustrated, has aluminum housings machined inside and out to give balance and lightness without sacrifice of sturdiness. A Hamilton-Beach type universal motor, 110-220 volts, 25-60 cycles, fits into the casing and has fan construction for a free circulation of air through the armature by way of the holes in the housing. A pinion on the motor shaft is in mesh with two idler



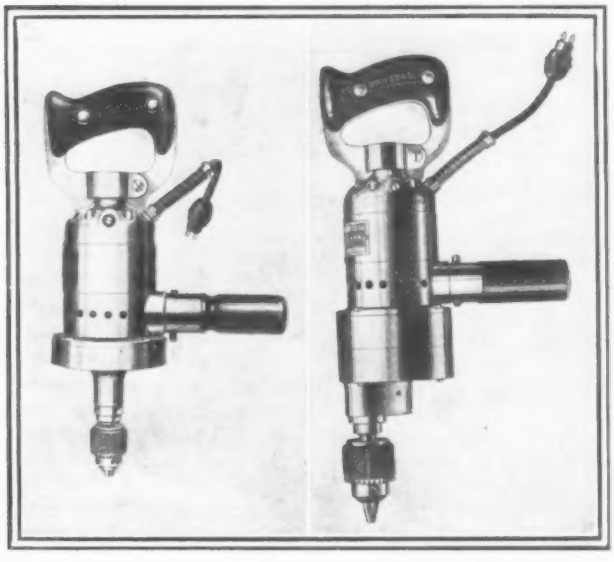
The Driving Unit of this Bench Drill Is Mounted on Double Trunnions, to Permit of the Whole Tool Swinging and Being Set at Any Angle

gears running in an internal gear surrounding them, giving a ratio of 6 to 1, a powerful transmission and one having no side strains producing friction in either main or motor shafts. The housing is packed with heavy oil or grease for constant lubrication of the working parts.

The Jacobs' chuck attaches to the shaft by standard taper and is readily removed by a release nut. The shaft itself runs in an anti-friction bearing and is of ground tool steel.

The supporting handle at the side of the housing has a pin-operated standard switch mounted in a screw-attached casing for ready removal. The pistol grip is removable so that the drill can be used with a taper socket in the tailstock of a lathe or as a drilling attachment on other machine tools.

The type A drill is 13 in. over all, weighs, with chuck, 6 lb., and has a capacity of ¼ in. in drilling steel. The type B drill is 15 in. over all, weighs 8½ lb. with chuck, and has a capacity of ⅜ in. in steel and similar metals, but has been used successfully in drilling ½-in. holes in 7/16-in. steel plate.



Portable Motor Hand Drills with Aluminum Housings Designed for Lightness without Sacrifice of Sturdiness. The drill on the left is the type A. The type B drill on the right, is offset for corner drilling

The chuck spindle in the type B drill is offset for corner drilling. It will drill to within ¾ in. of shelves, projections, etc., as the outside diameter of the chuck is parallel with the largest diameter of the motor housing.

The precision bench drill is of sensitive type, having handwheel control of the rack and pinion feed, which adjusts for wear and is also provided with a depth stop.

The bedplate is planed and scraped and is carefully machined to fit square with the ground vertical column. The table bracket is machined to make the table set at right angles to the column. The table is fastened to the supporting arm by a turned stud, and clamped by a knurled handscrew. The table bracket is fastened to the vertical column in like manner.

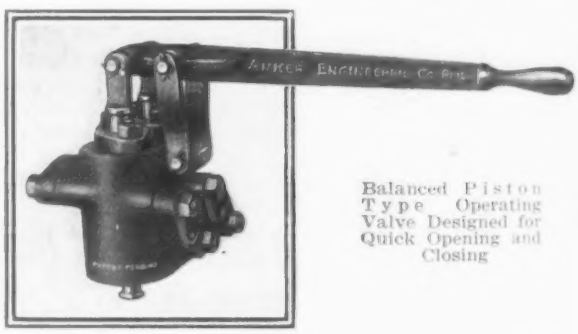
The entire driving unit, inclusive of the motor, is mounted on double trunnions to permit of the whole tool swinging and being set at any angle. The trunnion fork or yoke is graduated, and here as elsewhere all adjustments are obtained by knurled handscrews. The motor and drilling mechanism may be detached as a unit and used in any other machine tool, a taper shank being supplied for this use.

The universal sweep of this tool permits its use for other purposes than drilling. In diesinking and toolmaking it provides rapid and accurate means for undercutting, dovetailing, depthing, chamfering, etc., and even on straight repetition milling and profiling suggests many possibilities in systematic manufacturing.

These machines are manufactured by the Arnold Electric Tool Co., New Haven, Conn.

A New Hydraulic Operating Valve

The Anker Engineering Co., Widener Building, Philadelphia, has designed and will manufacture a balanced



Balanced Piston Type Operating Valve Designed for Quick Opening and Closing

piston-type operating valve, which may be utilized in steel mills as well as for operating hydraulic machinery where a quick opening and closing of the valve is necessary. An advantage claimed by the manufacturer is that it is balanced both on the pressure and exhaust sides and is so simple in construction that a cup leather may be renewed in a few minutes and a bushing, in which the cup travels, may be removed and replaced in less than 10 min.

H. A. Jensenius, president Anker Engineering Co., and designer of the valve, was formerly manager of the hydraulic department of R. D. Wood & Co., Philadelphia.

The Electric Furnace Co., Alliance, Ohio, has taken an order for electric furnace equipment to be shipped to Mexico for melting brass. The furnaces will be of the tilting type, rated at 105 kw. electrical capacity, 1500 lb. hearth capacity and with a melting rate of 600 lb. per hour. The Electric Furnace Co. now has under construction ten Baily electric brass furnaces at its Salem, Ohio, plant.

STEEL SHELLS USED BY ALLIES

Composition and Properties of British, French and Russian Metal from a German Source

The composition of some of the steel shells used by the Allies has been published by the Germans recently, based on analyses and test specimens of French, English and Russian shells. The analyses and tests were made by the Military Testing Bureau at Berlin, Germany, and the results as given below were published in the London *Iron and Coal Trades Review:*

Three French 7.5-cm. Shells.—The analysis of the steel of three 7.5-cm. French shells gave carbon content 0.37 per cent in two cases and 0.45 per cent in one case. The silicon content of the first was 0.47 and of the other two 0.24 and 0.13 per cent respectively; the manganese content varied between 0.84 and 0.64, and all three steels were low in phosphorus (0.022 to 0.040 per cent), and in sulphur (0.020 to 0.030 per cent). All three showed presence of copper (0.05 to 0.07). The elastic limit in the case of the first two was not well defined; in the case of the third it was 43.18 tons, and the ultimate strength 55.24 tons per sq. in. with 11 per cent elongation in 2 in. All test pieces were about 7/10 by 3/20 in. The ultimate strength of the one higher in carbon was 67.31 with 8 per cent elongation and that of the first 46.35 tons per sq. in. with 12 per cent elongation. The microstructure of the last two showed that the metal had been annealed at a comparatively low temperature; one showed troostite with segregations of ferrite, while the other had reached the osmondite stage.

Three Russian 7.5-cm. Shells.—These were coated with nickel on the outside. Only two of them were analyzed, showing 0.65 and 0.44 per cent carbon respectively, 0.21 and 0.18 per cent silicon, 0.92 and 0.80 per cent manganese; phosphorus content was 0.04 per cent in both cases, sulphur 0.02 and 0.05 per cent, and copper 0.07 and 0.01 per cent. The elastic limit of the third was reached at 28.57 tons, and its ultimate strength was found to be 48.26 tons per sq. in. with 16.4 per cent elongation. The corresponding figures for the first two were 54.93 and 57.15 tons per sq. in. with 11.3 and 8.0 per cent elongation. For these three Russian shells the elongation was measured between pop marks 3.2 in. apart. The three shells were evidently produced in different ways. The first was evidently drawn without subsequent heat treatment, the second was evidently annealed afterward, while the third was also drawn and allowed to cool at a comparatively slow rate, as its microstructure showed pearlite grains in a net with medium-sized meshes.

French 5.6-cm. Shell.—The carbon content of this steel was 0.43 per cent, with silicon 0.25, manganese 1.13, phosphorus 0.06, sulphur 0.05 and copper 0.04 per cent. The elastic limit was 23.81; ultimate strength, 39.69 tons per sq. in., with 25.3 per cent elongation. The microstructure showed that the metal was drawn at a high temperature or was subsequently annealed. Some slight inclusions of slag were visible. The metal showed pearlite grains imbedded in a ferrite mass.

Shell of Unknown Origin, 6.4-cm.—Carbon 0.30, silicon 0.33, manganese 0.97, phosphorus 0.007, sulphur 0.02, and copper 0.04 per cent. Elastic limit = 45.72; ultimate strength = 52.20 tons per sq. in., with 13.7 per cent elongation. The microphotogram shows a very close-grained even texture (martensite).

Two French 6.4 Shrapnel.—Carbon content in both cases 0.36, silicon 0.25 and 0.40, manganese 0.85 and 0.78, phosphorus, 0.044, sulphur 0.06, and copper 0.06 per cent, the same in both specimens. Elastic limit = 50.86 and 47.94 tons, ultimate strength = 56.83 and 56.39 tons per sq. in., with 11.7 and 12.6 per cent elongation respectively. The photomicrograph of the first shell showed a structure of martensite like the shell of unknown origin, while the other showed the osmondite stage of transformation.

Two 7.5-cm. Shrapnel.—These were probably of English origin. The carbon content of one was 0.47, of the other 0.34 per cent, silicon content was 0.33 and 0.19, manganese 0.86 and 0.62, phosphorus 0.085 and 0.063, sulphur 0.04 and 0.06 and copper 0.05 and 0.10 per cent respectively. The elastic limit of the high-carbon metal was 71.75 tons and its ultimate strength 74.93 tons per sq. in.; the elongation could not be measured owing to the tearing of the end of the test piece. The low-carbon metal gave elastic-limit 48.07 tons, and ultimate strength 51.94 tons per sq. in., with 12.6 per cent elongation. The photomicrograph of the first showed a uniform granular structure, while the structure of the second was distinctly sorbitic, not at all what one expected after the results of the tensile tests.

Russian 7.5-cm. Shrapnel.—The analysis gave: Carbon 0.58, silicon 0.18, manganese 0.62, phosphorus 0.014, sulphur 0.012, and copper 0.03 per cent. The elastic limit was reached at 56.20 tons and the ultimate strength was 65.53 tons per sq. in., with 9.8 per cent elongation. The microstructure showed a ground mass of pearlite with ferrite grains and a network of thin ferrite threads with large meshes.

English 8.3-cm. Shrapnel.—The carbon content of this steel was 0.80 per cent, silicon 0.20, manganese 1.08, phosphorus 0.046, sulphur 0.036 and copper 0.03 per cent. Elastic limit = 41.28 tons, and ultimate strength 63.50 tons per sq. in., with 10.5 per cent elongation. Of all the shells examined, this had the highest carbon content. The manganese content was also high. The photomicrograph showed a uniform granular structure.

Alloy for Resistance Elements Contains Titanium

What is claimed as a new and improved alloy for resistance elements, etc., and which has a high specific electrical resistance together with a prolonged life under high temperature conditions is covered by a patent (U. S. 1,274,250) granted to Wilbur S. Driver, East Orange, N. J., of the Driver-Harris Co., Harrison, N. J.

The invention is based on the discovery that when titanium in substantial amounts is added to other metals, such as nickel, iron, copper, etc., or alloys of metals, it causes a marked increase in specific electrical resistance of the alloy so formed and produces one which is extremely resistant to oxidization, especially at high temperatures. From numerous experiments it has been found that titanium is more powerful in these respects that chromium, and that titanium and chromium when simultaneously used as alloys with other metals, produce highly desirable results. Relatively large quantities of titanium can be used in alloys without making them too hard or too brittle, to allow rolling and drawing, says the inventor.

A list of alloys made according to this invention, together with the specific electrical resistance in microhms per cubic centimeter, is as follows::

	Nickel, Per Cent	Chromium, Per Cent	Titanium, Per Cent	Iron, Per Cent	Manganese, Per Cent	Specific Resistance
No. 1.....	75	..	6	19	..	77
No. 2.....	68	15	4	11	2	117
No. 3.....	65	..	8	27	..	96
No. 4.....	65	..	6	19	10	106
No. 5.....	60	12	1	24	3	112
No. 6.....	60	12	6	19	3	125
No. 7.....	40	15	6	39	..	112
No. 8.....	30	10	6	54	..	117
No. 9.....	30	..	6	64	..	100
		Copper				
No. 10.....	80	10	3	..	7	48
No. 11.....	75	..	8	..	17	57
No. 12.....	45	45	3	..	7	77
No. 13.....	94	..	5	1	..	32

The percentages in the table, while not exact, are approximately correct. The qualities imparted by the addition of titanium are particularly valuable in connection with resistance elements used in electrical apparatus such as heaters, toasters and cooking appliances, where the resistance elements are subjected to high temperatures by the passage of electric currents through them.

Titanium hardens the metals or alloys to which it is added so that the quantity of titanium that can be used is limited when it is necessary to retain such malleability and ductility as will permit the rolling or drawing of the alloy. The alloys above are all claimed to be sufficiently malleable and ductile to permit rolling and drawing.

EXPORT CONDITIONS

Blockade of Central Powers Still the Important Factor—Removing Restrictions

WASHINGTON, March 11.—The most important question in the resumption of normal export trade is still the blockade of the central powers and the Northern neutral nations. The representatives of the United States, as far as can be ascertained here, have favored the ending of that blockade for some time, but its relaxation has been opposed chiefly by France. The industries of that country fear that an early lifting of the blockade would take away the advantage that now is giving them an opportunity of overtaking the industries of Germany. The seriousness of the food situation in Central Europe, however, has made the matter more critical and considerable British influence is being brought to bear, as well as that of the United States, in favor of an early abolition of the blockade.

At the same time, the question of German ships is proving an important feature. The halting of the negotiations which were to give 300,000 tons of shipping to the United States has had a bearish effect on export business, but an agreement on this subject seems to be in sight. Although these ships were to be used to bring home American troops and to carry food to Europe, their employment on the latter task would relieve other export congestion. At the same time, it would reopen important channels for general export business.

The War Trade Board has made broad allowances for the resumption of American trade with Luxemburg and with that portion of the Rhine provinces of Germany which is included within the area of military occupaton by the American and the Allied armies. All commodities that have so far been carried on the "free" list for the northern neutrals as well as Switzerland may now be exported to this territory without any restrictions.

For licenses to export any other commodities to this territory, says the announcement of the War Trade Board, the consignee therein should apply to the Allied military authority in the particular occupied zone for permission to make such importation. This Allied military authority will submit the application, with recommendations, to the Inter-Allied Economic Committee at Luxemburg. This committee, if the application is approved, will issue an import license, and will cable the particulars thereof to the War Trade Board at Washington. The proposed consignee in the occupied territory will also furnish particulars of such license to the exporter in the United States, who will state on his application for export license the serial number of such import license.

To import into the United States commodities from such territory, applications for individual import licenses should be made to the Bureau of Imports, War Trade Board, Washington. License to export such commodity from the above territory must be obtained from the Inter-Allied Economic Committee at Luxemburg, which will cable the particulars thereof to the War Trade Board, Washington. The proposed consignor in the above territory will also furnish particulars of such license to the importer in the United States, who will state on his application for import license the serial number of such export license. The War Trade Board also announced that commercial communication with the territory above described is now authorized.

The Bureau of Foreign and Domestic Commerce has made an interesting survey of the details in the increase of American exports to all parts of the world in January, 1919, as compared with the same month in 1918.

Of the $118,000,000 total increase in value, $36,000,000 went to Europe, $15,000,000 to North America, $30,000,000 to South America, $19,000,000 to Asia, $14,000,000 to Oceania, and $4,000,000 to Africa.

France and Russia are the only countries showing a decrease; exports to France fell off $40,000,000, and to Russia $3,000,000. Increases to the neutral countries range from $12,000,000 each for Netherlands and Spain, to $7,000,000 for Norway, $5,000,000 to Sweden, and $4,000,000 to Denmark. Exports to Belgium increased $14,000,000 and those to Italy and the United Kingdom $9,000,000 each.

Sales to Argentina increased $16,000,000; to Japan and Australia, each $8,000,000; to Canada, Cuba, Brazil, Siberia, and the Phlippines, each $5,000,000; and to other countries, from $1,000,000 to $3,000,000.

For the seven months ending January, 1919, as compared with the like period ended January, 1918, of the total exports of $3,800,000,000, over 60 per cent, or an increase of $163,000,000, went to Europe. North America received increased shipments amounting to $105,000,000; Oceania, an increase of $36,000,000; South America, $18,000,000; Asia, $17,000,000; and Africa, an increase of $9,000,000.

Trade with Russia for this period declined $111,000,000, and with Siberia, $22,000,000, while exports to Central America, Mexico, Cuba, and Brazil also show decreases of from two to six million dollars.

Belgium shows the most striking increase during this period, its exports gaining $74,000,000 over the seven months ended January, 1918. Shipments to England also increased by an equal amount, followed by Australia and New Zealand with a gain of $26,000,000; Italy, $23,000,000; Japan, $15,000,000; Argentina, $12,000,000; China, $12,000,000; the Philippines, $10,000,000; France, $8,000,000, and other countries showing smaller increases.

Exports to all neutral European nations increased in the seven months ended January, 1919, Norway and Sweden leading with $17,000,000 each; Netherlands, $16,000,000; Spain, $14,000,000, and Denmark, $10,000,000.

German Steel Output

The German output of finished steel in the latter part of the war is now made public and includes Luxemburg up to November, 1918. The following table gives the details in metric tons:

	1916	1917	1918 to Nov. 1
Rails, etc.	1,180,591	1,007,408	886,085
Structural material, 80 mm. and over	780,681	608,825	339,494
Bars and other shapes, under 80 mm.	3,941,421	3,108,975	2,487,114
Hoops	331,144	373,389	270,391
Wire rods	1,043,484	935,627	681,106
Plates and sheets, 5 mm. thick and over	918,815	777,699	623,022
Sheets under 5 mm. thick.	797,294	813,092	673,022
Tin plates	58,232	59,830	27,504
Tubes	499,366	413,184	376,991
Wheels, axles, tires, etc.	232,794	268,390	206,987
Forgings	298,246	356,949	303,550
Other finished products	913,161	844,521	226,318
Totals	10,995,229	9,567,889	7,101,584
Total steel output	16,182,520	16,587,360	13,756,813

The semi-finished steel output in 1916 and 1917 was 2,202,465 tons and 3,154,663 tons respectively, with that of 1918 up to Nov. 1, 3,162,745 tons.

Two-thirds of the finished steel and over one-half of the semi-finished steel was made in the Rhineland and Westphalia district.

To Produce Brake-shoes for the Orient

The American Brake-shoe & Foundry Co. hereafter will manufacture on the Pacific Coast the brake-shoes for railway and traction cars which constitute the bulk of its business. It has incorporated a subsidiary known as the American Brake-shoe & Foundry Co. of California, and has taken over from the Enterprise Foundry Co. that portion of its plant which heretofore was devoted to the manufacture of brake-shoes.

The plant is to be greatly enlarged, it is rumored, with the object of providing brake-shoes for the railroads which are projected in China, as well as for the Trans-Siberian system and other railroad enterprises in foreign countries bordering on the Pacific. Thomas Finegan, vice-president of the parent company, is president of the new California organization.

Steel Manufacturers Agree to Co-operate

Invitation of the Industrial Board of Department of Commerce Is Accepted—Government Initiative Without Control Is Now Proposed at Washington

IN response to the call of Judge E. H. Gary, president of the American Iron and Steel Institute, more than one hundred representatives of the iron and steel industry met in New York last Thursday and discussed the plan of Secretary of Commerce Redfield to bring about stabilization of business.

After the meeting the following official announcement was given out:

At the meeting of representatives of the iron and steel industry to-day at the Waldorf-Astoria, after full discussion, it was unanimously voted to accept the invitation of the Industrial Board of the Department of Commerce, organized by approval of the President, to co-operate in the endeavor to stabilize business conditions, and the whole subject matter was referred, with power, to a committee. The members of the committee follow:

Elbert H. Gary, James A. Farrell, Charles M. Schwab, John A. Topping, Alva C. Dinkey, L. E. Block, James A. Burden, E. G. Grace, C. H. McCullough, Jr., H. G. Dalton, A. F. Huston, James A. Campbell, Willis L. King.

After the resolution to co-operate was adopted, George N. Peek, chairman of the Industrial Board, was present and addressed the meeting. His speech was attentively listened to and he was generously applauded.

Judge Gary, in addressing the meeting said:

Address of Judge Gary

"We have had no meeting nor occasion for a meeting of the iron and steel industry generally since Dec. 9 last, when we gathered to discuss and decide what recommendation to make to the War Industries Board concerning prices, pursuant to the request of that board or its price fixing committee. Between the time the request was made and the day fixed for the meeting in Washington conditions changed, and as a consequence our report to the War Industries Board was made unnecessary, although the committee which had been designated by the steel interests appeared in Washington at the appointed time and place. Notwithstanding at our meeting here there were, at the beginning, differences of opinion concerning our proposed action, I think time has demonstrated that our final conclusion was wise. Circumstances justified the decision to recommend moderate reductions in prices of our commodities, and perhaps the fact that we voluntarily made reductions tended to stabilize business conditions generally. At any rate, the disposition of the large number of men who attended the meeting, to harmonize their views and to place their interests in the hands of a few men who had proved their efficiency by hard work, continued patience and painstaking effort, redounded to the credit of all who participated. Consideration by each for the welfare of all others and an effort to co-operate in advancing and protecting the interests of everyone, so far as practicable and right, have dominated the minds of those who are connected with our industry and have been and will continue to be of great benefit so long as we are controlled by these principles.

Co-operation Invited

"On this occasion we have met to discuss and consider the question of co-operation as presented to us by the Industrial Board of the Department of Commerce. This board has been appointed by the Secretary of Commerce for the purpose of conferring with the different lines of industry, in the effort to stabilize business conditions generally throughout the country. The Secretary of Commerce, after consideration and investigation, reached the conclusion that during the transition period from a war basis to a peace basis there might be disturbances in business, with possible reactions, if not depressions, decreases in or interruptions to employment, and delays in extending enterprise; and after conferring with other members of the Cabinet and the President of the United States he appointed the industrial board referred to. The Secretary of Commerce, a few days since, addressed a letter to the president of the American Iron and Steel Institute, in which the secretary stated his plans and requested co-operation by our industry, and also opportunity on the part of George N. Peek, chairman of the board, to explain in detail what was proposed. The president of the institute thereupon called together some of the leading manufacturers who were readily accessible, before whom Mr. Peek appeared and discussed at considerable length his plans and reasons for their adoption, after which the present meeting was called.

No Reason to Complain

"It is my opinion, and I believe the opinion of most of the large number of men who are assembled here to-day, that since the armistice was signed the iron and steel trade, generally speaking, has been better than it was represented to be in some of the publications; that it has been better than we feared it would be; that all things considered, we have no reason to complain; and that the number of unemployed has been much less than one would suppose from some of the statements which have been freely circulated. We know that, as a matter of fact, on account of the ordinary turnover in labor, and other reasons which result in idleness, temporary or otherwise, there are always large numbers of unemployed, and therefore it frequently happens that when people are expecting, in consequence of unusual conditions, an increase in unemployment, exaggerations are made. Personally, I have believed if business men and others who are interested in business conditions and results would retain their composure and courage, we would gradually, if moderately, return to a condition normal and satisfactory. However, the Secretary of Commerce, a very wise and thoughtful man, believed, from his information and advice, that it was desirable to anticipate possible future adverse conditions, and therefore took the action mentioned, and, of course, this having been published, the natural result has been or will be to temporarily affect business progress until there can be a successful co-operative movement which is calculated to inspire confidence and activity.

Barometer of Trade

"The steel industry is still more or less the barometer of trade. It involves large production, large amounts of working capital, large numbers of employees and has a decided influence upon the commercial and financial interests of the country. We occupy positions of great responsibility. What we do at this meeting may have an important bearing upon the whole business situation. We must not, we will not, intentionally make a mistake. During the war we have been called upon to do great things, and we have cheerfully and faithfully responded. I think we are bound to say we have in the main been treated fairly. We have served the Government to the best of our ability, and governmental representatives have, in positive language, commended our efforts.

"Now we are called upon again by a Government official to co-operate with the Government in the endeavor to stabilize business conditions, to protect, so far as practicable and reasonable, capital and labor, for they must always go hand in hand if success for either is achieved, and to bring about results which no reasonable man will deny are desirable. The methods were not suggested by us. They originated with a disinterested high-minded and capable public official whose obligation and whose desire are to best serve his coun-

try. We must on this occasion rise to a high plane of unselfish observation and there determine our course.

Decision of the Board

"Those who have been personally consulted, including all the members of the Board of Directors of the Institute who could be reached, have decided to recommend to this meeting that we promptly accept the invitation of the Government to co-operate, so far as proper and consistent, in the cause which has been presented and has been assigned to the Industrial Board made up of Mr. Peek as chairman, and other equally worthy men who may be depended upon to act fairly and intelligently. If you should to-day submit your interests to a comparatively small committee, that committee would come into conference with the Industrial Board and make an effort to agree upon prices intended to be just toward all who might be interested in the results, including seller, purchaser and the general public. It is intended, as usual, to give opportunity for full discussion, and I ask you to withhold final judgment as to your action until the last speaker has been heard and the last reason expressed.

The League of Nations

"There is ahead of us large business prosperity. We may hasten or retard its progress, depending upon our attitude. If we avail ourselves of the opportunities offered we will succeed. We must be resolute, fair-minded and confident. We must apply the spirit of co-operation whenever practicable. We must have faith in ourselves, in each other and in our country. Peace has not yet been established throughout the world, and this fact more or less adversely affects industry. Still we have reason to expect an early settlement of most, if not all, of the important differences between nations. A League of Nations will soon be agreed upon, for the sentiment in its favor is well nigh universal among the civilized peoples of all countries. The criticisms which are found in the speeches recently made in the Congress of the United States, with possibly slight exceptions, were not intended to be understood as opposing a practicable and workable agreement between leading countries which will result in preventing future prolonged international conflicts. The objections made relate to some of the conditions and terms contained in the covenant, or constitution, which has been reported for consideration by the General Council and, in most cases, to proposed forms of procedure. Surely the great men who participate in the Peace Council will find a basis and a method for carrying into effect what they, and the hundred millions whom they represent, most earnestly desire.

"And then, after peace is declared and made secure and with a cordial and reasonable co-operation between the Government and business interests, we should realize the greatest prosperity in our experience."

Industrial Board to Meet Institute Committee

WASHINGTON, March 11.—The first step to frame a schedule of lower iron and steel prices will be taken March 19 at a conference here of the new Industrial Board of the Department of Commerce and the special committee appointed last week by the American Iron and Steel Institute.

The details of the machinery by which this schedule is to be worked out is being left to the iron and steel industry. Chairman George N. Peek of the Industrial Board declares that he hopes the committee will be able to present schedules which the Industrial Board can approve. The latter does not plan to hold any meetings nor to participate in any general conferences concerning the data on which prices are to be based.

It is the hope of the board, according to Chairman Peek, that the steel industry—and the other industries which are to follow—will present their own schedules. These will then be gone over in detail by the board. If it approves of them they will be promulgated as the figures which are to bind the various purchasing bodies of the Government and will be recommended to the public as fair prices. It is expected that in the iron and steel industry the first schedules will confine themselves to a series of basic prices, beginning with ore and covering pig iron and the more important finished materials. If the steel committee and the Industrial Board agree upon this schedule, it will be used by the latter as the framework for a more nearly complete series of price schedules on individual items. At the same time, it is expected that even this preliminary list will be sufficient to form a basis for a general taking of orders on which the final prices will govern.

The machinery of this whole procedure is still somewhat vague. The new board makes little pretense to possessing data by which to judge the suggestions of the steel committee. It is expected, however, that the steel men will try to frame a schedule that will do as much as possible toward stimulating buying. For that reason, it is expected that their prices, in general, will be low enough to result in a real acceleration of business.

Members of the board are convinced that the latent buying possibilities of the country are so great that the mere stabilization of prices on a schedule that promises to remain effective for some time will bring heavy orders into the market. The Railroad Administration has promised its co-operation, although its actual buying power will depend on the extent to which the banks can finance extensions without the help of the $750,000,000 revolving fund that Congress failed to approve.

Secretary Redfield of the Department of Commerce, who initiated this program, is enthusiastic over the co-operation which he says has been promised, not only by the steel industry but by other industries as well. It is expected that the brick and cement industries will be present for their innings. The lumber men also have promised co-operation. The Southern Pine Association, in convention at New Orleans, passed resolutions heartily endorsing the project. A special effort is being made to lower prices throughout the building industries in an effort to stimulate building and general construction at the present time. In this connection, it is expected that the Railroad Administration may yet be induced to afford lower rates. Director General Hines of the Railroad Administration has already promised lower rates on road-building material. This led to reports that the Administration would lower rates on building material in general, including structural steel. Officials of the Administration, however, declare that this is without foundation. So far, there has been no program to extend this beyond cement, sand, gravel and other items of actual road-building.

The prices which are to be approved by the board will have no particular period of life. They are to serve only as temporary introductions to general business resumption. According to the announcement of the Industrial Board, they are to be used merely to bring back to normal operation the law of supply and demand.

One important feature in the operation of the board's program is expected to come from the mutual interests of various factors in the whole problem. For instance, the price of builders' hardware, according to statistics prepared by the old War Industries Board, increased 190 per cent, while the average for steel prices has been only 115 per cent. If the high price of builders' hardware remains, it will do much to prevent a general resumption of building. For that reason, it is expected that the iron and steel industry will attempt to equalize all prices for the general purpose of stimulating building.

One of the big questions that confronts the board is the peril of anti-trust law complications. This, however, it is declared, is being taken care of by keeping the Department of Justice in touch with all operations.

Edward T. Quigley, assistant solicitor for the Department of Commerce and the personal representative of the Attorney General, will sit with the board. It is contended that under the Supreme Court's decision applying the "law of reason" to the Sherman law the agreements to be made between the Government and the various industries for lower prices cannot be held criminal restraints of trade. It is expressly announced that the new board has no intention of taking any part in questions of export business or in the general problem of extending the foreign trade of any industry. Neither is it expected to offer any suggestions for the removal of the blockade of the central powers and the Northern neutrals. O. F. S.

Industrial Board Announces Its Policy

WASHINGTON, March 11.—Three experienced representatives of the iron, steel and metal working industries are members of the new Industrial Board. They are:

George N. Peek, chairman, Moline, Ill., formerly vice-president Deere & Co.

Samuel P. Bush, Columbus, Ohio, president Buckeye Steel Castings Co.

Thomas K. Glenn, Atlanta, Ga., president Atlantic Steel Co.

The other industries represented are the hardwood and dry goods industries. The former has a place on the board in the person of William M. Ritter, president of the W. M. Ritter Lumber Co., the largest hardwood lumber corporation in the country. Mr. Ritter has been one of the prime movers behind the plans for this industrial board and has advised Secretary Redfield at every step of the way. The representative of the dry goods industry is George R. James, Memphis, Tenn., president of the William R. Moore Dry Goods Co.

The other two members of the board represent the Government. Anthony Caminetti, Commissioner of Immigration, was put on to take the place of Hugh C. Frayne as the representative of the Department of Labor. He will look out for the labor interests as well as those of the Government. T. C. Powell, Director of Captal Expenditures for the Railroad Administration, will advise on governmental, railroad and financial questions.

The first act of the board was to issue a 2000-word mimeograph statement of the problem it is trying to solve. Chiefly the statement goes over the same ground covered by previous statements issued by Secretary Redfield. Without revealing the machinery by which it plans to accomplish its task, it goes into considerable detail as to the various phases of the present uncertainty of market and industrial conditions and lays much stress on the value of co-operation to aid in assuring prosperity.

Conditions Described

Under the heading of "The Condition" the statement summarizes its analysis by saying that "(a) *Although* commercial stocks are depleted; there is plenty of money; building and construction are several years in arrears of necessity; a long period of enforced economy is greatly relieved; and markets are in prospect in all parts of the world; *Still*, buying is timid and has been decreasing in volume; money is also timid and remains in bank; some mills and factories are idle—few are running full; construction of public and private works has not begun; and non-employment is spreading.

As to "The Cause" the statement declares:

"(a) War required production abnormally increased generally and *abortively* increased respecting certain commodities specially needed for war. This irregular increase was secured by enormously increased prices. Consequently the sudden termination of war left a highly inflated and very irregular market, which is generally far above what the peace demand will support and which is not homogeneous, many prices being *abortively* above their place in the normal pattern.

"(b) This situation was originally created by the abnormal operation of the law of supply and demand, stimulated by the great need of the European countries for war materials before this country entered the war, but after we entered the war the law of supply and demand was adjourned and was replaced by such new and powerful forces as priority certificates, compulsory and commandeering orders, export and import restrictions, and price fixing. These forces worked through comprehensive agreements and co-operation between the Government and industry. Therefore, it may fairly be stated that the existing condition was not brought about by the normal operation of the law of supply and demand.

"(c) The normal operation of the law of supply and demand cannot cure what it did not cause, first because it cannot operate until buying begins, and second because buying cannot begin until we have a more normal, stable and homogeneous market.

Prices Must Fall

"(d) Everybody knows that some prices must fall. No one dares buy until they do fall, and even then everybody will wait to see how far they fall. Individual action in lowering *selling* prices is therefore timid, unscientific, and long drawn out. It cannot render the market uniform or stable, but, on the contrary, renders it unstable, dangerous and panicky. The law of supply and demand *would* cure the situation eventually, but can we afford to wait, first through a period of suspicion and uncertainty, then through a panicky crash in all markets, and then through chaotic readjustment? By sane and temperate action all this can be avoided and the law of supply and demand helped over the gap between hold-over war prices and a stable level.

"(e) Some uncertainty results from governmental accumulation of facilities and raw, finished and partly finished materials, which must be fed very carefully into the market. This situation requires the co-operation and advice of industry."

The Remedy Proposed

"The Remedy" set forth in this statement consists largely in an appeal for industrial co-operation under governmental initiative, but without Government control. On this point the statement continues:

"(a) The condition must be cured as it is caused. It was not caused by the normal operation of the law of supply and demand but by general, comprehensive co-operation and agreement between industry and government. It must be cured by the same kind of co-operation and agreement—a consummation possible only at the instance and with the approval of government.

"(b) Wholesome co-operation in American business at Governmental instance was proved in the War Industries Board (W. I. B.). Governmental *control* as practiced by the W. I. B. is no longer necessary, but co-operation and agreement in industry at governmental instance and with governmental approval is necessary to bring the law of supply and demand back into normal operation and to let loose prosperity.

"(c) To this end the President has authorized a board, largely of W. I. B. men, operating on W. I. B. ideals, *minus W. I. B. control*, to call industry together group by group, and let them decide on prices to be offered to the nation as the governmentally approved judgment of assembled industry on a price scale low enough to be stable, homogeneous throughout the whole fabric, and founded so solidly on a comprehensive review of conditions as to encourage general buying, including that of the railroads and other governmental agencies, and the resumption of normal activities."

Although it declares there must be no wage reductions until the cost of commodities has been materially decreased, the statement ventures the belief that wages will drop automatically later. It also pictures most at-

(*Continued on page* 726)

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THE IRON AGE

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Price Stabilizing

Surprise has been expressed in some quarters that the iron and steel manufacturers at their meeting last Thursday unanimously accepted the Department of Commerce plan for stabilizing market prices. It was known that many in the steel trade had been skeptical of the adequacy of the plan to meet the problems of price readjustment with which producers and consumers are wrestling. But having been summoned by an important department of the Government, acting with the President's approval, to co-operate in the new movement, there was no disposition to do other than comply.

In all the economic adjustments compelled by the war and by its ending, the currents of trade have been and are still so wrested from their natural courses that a speedy return to normal procedure is not to be expected. It has been asserted frequently that now that the war is over, the law of supply and demand should be allowed to re-assert itself, even though the process involve some rough-shod riding. In its statement of what it proposes to do, given in large part in another column, the Industrial Board says that its purpose is "only to give Governmental assistance to aid the law of supply and demand in resuming its normal functions." This might imply a gradual adjustment during which the Industrial Board would keep its hand on the price situation in much the same way as the Price Fixing Committee functioned under the regime of the War Industries Board. Secretary Redfield, however, in announcing his plan says "it is believed that the reductions from the high prices to the proper level, so that consumers may be justified in buying, should be made *at once by one reduction.*"

The implication of this statement and of others from Washington sources is that a very considerable reduction from the present level is expected, though it is conceded that for some time prices will rule well above those of the pre-war period. There is a considerable gap between the smallest and the largest cuts suggested for finished steel products, in the discussions of the past week. The situation is not one in which consumers on the one hand are calling for large reductions, which producers on the other hand are opposing. Some important consumers, well aware of the effect on their own products of a deep cut in finished steel, have urged that the time is not ripe for material reductions in the forms of steel they buy.

In the iron and steel trade itself there is the same diversity of interest that has appeared in the price conferences at Washington in the past 18 months. The ore men argue that with present labor and transportation costs their prices cannot be cut. Pig iron producers, while some of them have cut the new prices named in December by $1 or $2 a ton, protest strongly that a $5 reduction below that of December would be disastrous. Many producers of finished steel, even integrated concerns, contend that a $10 reduction, which has been suggested from some sources, is not to be thought of.

The Industrial Board predicts that under its plan as now projected "buying will begin immediately." The trade hopes this prediction may be realized. The board fully recognizes that there are obstacles to its success and in its statement given elsewhere answers many of the objections that have been raised. The main contention of those who do not accept the proposal as a remedy or even as a palliative of the present condition is that it does not take proper account of the element of time in the transition from a war to a peace basis. They argue that the minds of buyers have not yet been able to bend to the problems of investment and construction. It is also urged that the difference between average prices of steel products before the war and any concession that has been proposed from the war basis is so great that buyers will not take hold with confidence. On the other hand there is reason to question the assertion that the bringing forward of the Redfield plan has interrupted a buying movement of any moment.

Steel manufacturers are putting no great emphasis upon wage reductions as a necessary concomitant of price reductions, since they are not persuaded that either can beget a broad buying movement at this juncture.

The Number of Unemployed

Estimates recently published by the United States Employment Service as to the number of unemployed have aroused much controversy. The principal criticism has come from Cleveland and a few other cities, which have claimed that the number of their idle men has been greatly exaggerated. On the other hand, there is the allegation that the number of unemployed is much larger than has been indicated by the reports from Washington, and THE IRON AGE has received a carefully written letter from a manufacturer of Pottstown, Pa., who states that he is not writing for publication, but is presenting a view of present conditions that he thinks worthy of consideration, as he is convinced that readers of THE IRON AGE would be extremely interested in knowing the actual shrinkage in the aggregate of hours of employment, as well as the number of unemployed.

Our correspondent refers particularly to an article published in THE IRON AGE of Feb. 27 in which it was stated that the number of unemployed estimated by the United States Employment Service was about 360,000. He points out that 1,200,000 men have been demobilized and that since the armistice was signed the strictly war plants have almost ceased operations (exclusive of ship plants) releasing hundreds of thousands of men and women, and he inquires who has absorbed the million two hundred thousand released from the Army and the thousands from the Navy and munition plants.

The writer of the letter expresses his conviction that the actual condition should be known for the reason that knowing the actual facts might "stimulate in the minds of working men and women some doubts as to the advisability of going completely under the sway of those labor organizers and agitators who, it would seem, regardless of conditions and consequences, are driving ahead even now for higher wages, shorter hours and overtime rates." The author then says:

> Unemployment means industrial depression, but to state the number unemployed does not truly represent the facts.
>
> A survey of this district might be made and show, for instance:
>
> October, 1918—Total number working, 20 plants, 8000.
> February, 1919—Total number working, 20 plants, 7200.
>
> That would indicate a 10 per cent shrinkage and on the face not look so bad.
>
> But suppose the report made as a result of the survey should say:
>
> October, 1918—20 plants; employees, 8000; operating hours, 80,000.
> February, 1919—20 plants; employees, 7200; operating hours, 40,000.
>
> That would indicate a 50 per cent shrinkage and clearly show, too, the true aspect of the situation.

The observations of the Pottstown manufacturer and also the complaints of Cleveland and other cities are entitled to careful consideration. The sole interest of THE IRON AGE is in seeing that the truth is ascertained as nearly as possible and published. The policy of this paper is based on the belief that telling the truth as to labor conditions, markets and all other affairs of the business world is best ultimately for all concerned. In regard to labor statistics, we have published the most accurate information obtainable, stating that it did not profess to be entirely correct. It certainly has been very difficult even to approximate the number of unemployed, and much of the criticism that has been offered has not been of the constructive kind. The investigation of the Cleveland Chamber of Commerce and the suggestions of others who are giving the subject attention should result in better methods of collecting statistics and clear the whole subject of the imputations of motives, which have been bandied much too freely.

Heavy Steel Production

The high rate of steel production that has obtained to date has been given less attention than it deserved in most of the appraisals made of the steel situation. In many quarters, moreover, there has been no recognition of the fact that the steel industry has operated at not far from its capacity, it being inferred on the contrary that operations had dropped to a very low ebb.

The monthly reports of ingot production as presented by the American Iron and Steel Institute cover the production of 29 companies, which in 1916 made 88.14 per cent of the total output and in 1917 made 85.1 per cent. Thus they are quite representative of the industry as a whole. Furthermore, estimates of the present capacity do not involve any considerable probable error. As indicated in THE IRON AGE of Jan. 16, 1919, capacity on Jan. 1, 1916, may be taken at 40,000,000 tons and capacity at the beginning of this year at 49,000,000 tons. These figures rest upon the actual production in 1916 as reported, the industry having been able to run full during that year, plus allowance for new capacity created during the past three years. Capacity Jan. 1, 1917, on this basis, was about 43,600,000 tons and on Jan. 1, 1918, it was about 47,350,000 tons.

In order to compute percentage rates of operation since the beginning of 1918, on the basis of the monthly ingot report, it is necessary to allow for the increasing capacity during 1918. This is done by distributing the known increase in 1918 over the first three quarters, taking capacity at the following figures: First quarter, 1918, 47,350,000 tons; second quarter, 47,900,000 tons; third quarter, 48,450,000 tons; fourth quarter, 49,000,000 tons, and the same for the first two months of this year. Allowing for the production not included in the monthly ingot reports, counting the number of steel working days in the month and year, and proportioning the resulting rate of production to the capacities here assumed, the following operating rates in the production of steel ingots are shown:

Steel Ingot Production in Per Cent of Capacity

	1918	1919
January	63	85
February	73	83
March	92	
April	93	
May	93	
June	94	
July	91	
August	87	
September	97	
October	92	
November	88	
December	89	
Average	87⅝	84

By comparison with much that has been said, in and out of the steel trade, the above is a re-

markable showing. The production in February fell only 16 points under the maximum on record, that in September of last year, and was only slightly below the average proportion shown for the whole year 1918, while the actual tonnage was in excess of the average in 1918, the percentage being lower but the capacity on which it is figured being higher.

A still more remarkable comparison, however, can be made. The rate of production in February was 40,900,000 tons a year, and this compares with actual outputs as follows:

Production of Steel Ingots, Gross Tons

1907	22,559,477	1913	30,280,130
1908	13,677,027	1914	22,819,784
1909	23,298,779	1915	31,284,212
1910	25,154,087	1916	41,401,917
1911	23,029,479	1917	43,619,200
1912	30,284,682	1918	*42,200,000

*Estimated.

Thus the rate of output last month exceeded by 35 per cent the highest average rate in any calendar year before the war. The highest rate attained in pre-war time was about 35,000,000 tons, in the fore part of 1913, and over that rate last month's performance showed an improvement of 17 per cent.

The Burden of Unemployment

When Government intervention in social matters goes so far that a high official of the United State Employment Service says that women should not be displaced by returning soldiers but instead the employer should take on his former employees "until it hurts," it is time to suggest that there is such a thing as honesty in employment. It is inconceivable that a right-minded person would long take wages without giving some fair return, for the wilfully lazy are not relatively numerous.

One of the weak situations in industry since the signing of the armistice has been the keeping of workers at useless tasks, though fortunately this is a lessening factor in the process of readjustment. So concerned was everybody over the possibilities of unemployment, even in the United States, that much shell making and other war manufacture was continued in the face of supplies far beyond the needs of any possible recurrence of hostilities. Quickly the reason for the maintenance of factory operations reached working circles and aside from the realization by workers of the uselessness of such output, must also have come the understanding of mollycoddling and paternalistic fear that beget anything but self-reliance and efficiency. To treat adult wage-earners as though they were children and to urge as an obligation that employers pay out wages whether or no is hardly a democratic ideal. To those who have been in this country months rather than years and are tainted with the caste system, the proposal may have an appeal, but there is an independent strain in the average American which can be counted on to rebel against excessive Government concern.

In Great Britain, where paternalism is in full flower, the Government has promptly assumed responsibility for unemployment due to the shift to a peace basis. It is paying to every discharged soldier about $7.25 a week, and it will continue to do so for six months after his discharge, or until he finds a job. Every man who worked in munitions will receive the same sum per week for a quarter of a year after his war-work ends, or until he finds a peace-time job. Every woman or girl who worked in the war factories will receive $6.25 a week from the Government for half a year, or until she finds a position. The London *Times* estimates that the unemployed in Great Britain will soon number a million. It is to be said at least of this British plan that it recognizes that the obligation is the Government's and not the individual employer's.

High Prices for Exports

While Government limit prices for iron and steel were on the basis of "one price for all," i.e., the United States Government, domestic consumers and the Allied governments, it should be noted that the establishment of these Government prices did not result in a decrease in the average prices of the commodities exported. The average values of iron and steel exported did not decline at the time of Government price fixing, nor has any decline been recorded even in the latest statistics, which cover the month of January, 1919.

Government price fixing began Sept. 24, 1917, when coke, pig iron, bar, plate and shape prices were named, this price fixing being followed Oct. 11 by the naming of prices on unfinished steel, while in November various additional finished steel prices were set. The export statistics show, as to billets, ingots, blooms, sheet bars, etc., that in the first eight months of 1917 the average value of these exports, at seaboard, was between $70 and $80 for each of the months. In September there was a jump to $84.50, and thereafter the monthly average each month fell between $80 and $90, clear through the year 1918. This means that in no month after price fixing came in, was the average declared value as low as in the highest month previously.

A similar showing is made by various other steel commodities. For instance, wire nails were set at $3.50, base, early in November, 1917. The export average for that month was 5 cents per pound, while in no preceding month had the average been as high, and in none of the 13 subsequent months which the statistics cover has the average been as low. The highest average in the whole 13 months fell in October, 1918, 6.1 cents. Barbed wire makes a somewhat similar showing.

After the early months of 1918 the export restrictions were very rigid, and it can hardly be thought that exports of steel products not intended for war purposes, and on which therefore there was no price limitation, could have operated to advance the average materially. Evidently the high prices obtained on steel products that were exported for war use, but which, presumably, had been contracted for by Allied countries before Government limits, on the basis of "one price for all," were set.

The showing is not altogether exceptional as

to the influence Government control has actually exerted. While the rules were rigid, the control did not last long enough to govern all transactions, either because so much business had been previously put through or because the control did not function in full at the start. There have been various other illustrations of the same principle. Coal, too, for instance, remarked recently with respect to coal: "And speaking of reserve stocks, it is rather mystifying how the so-called non-essential industries, which were presumably receiving no coal whatever during the critical period, were discovered with large accumulations of fuel when the armistice was signed. But why uncover the family skeleton?" Such experiences were not confined to coal. Though the distribution of steel was rigidly controlled for several months, there were some consuming industries either with no place on the preference list or with a low rating that had very considerable stocks of steel even at the end of the war.

Iron and Steel Industries in Canada

WASHINGTON, March 11.—The iron and steel industries of Canada have become first in the list of the manufactories of the Dominion. This fact is the most interesting feature of the census compiled by the Dominion Bureau of Statistics of the manufacturers of Canada for the year 1917. By dividing the iron and steel industry into a series of component parts, the statistical figures put the amount of capital invested in the electric light and power industry at the head of the list with $356,004,168. The total capital in the iron, steel and metal working industries, however, was $399,341,493, divided as follows:

Cars and car works, $98,274,585; steel furnaces and rolling mills, $91,894,777; agricultural implements, $70,493,801; foundry and machine shop products, $69,915,032; car repair shops, $68,763,298.

The total capital invested in Canadian industrial plants in 1917 was $2,772,517,680. The gross value of the various iron and steel industries with the allied manufactures reached a total of $651,786,805 in 1917 out of an aggregate gross value of goods made in the Dominion in that year of $3,015,506,869.

The cost of materials was $1,602,820,631, leaving, for all industries, a net value added by the process of manufacture of $1,412,686,238, or $5,449,098 more than the gross value of production in 1915.

Large Decrease in Iron Ore Imports

A marked decrease in iron ore imports characterized 1918. The total for the year was only 787,468 gross tons as compared with 971,663 tons in 1917 and 1,326,864 tons in 1916. These figures compare with 2,594,770 tons in 1913. The following official table shows the source of these imports in recent years in gross tons:

	1913	1916	1917	1918
[illegible]	112,580	161,422	152,713	38,385
[illegible]	356,074	212,063	63,715	.....
[illegible]	179,866	137,963	195,588	115,854
[illegible]	1,635,622	716,571	546,069	632,442
[illegible] and Labrador	213,168	.....	.....	.....
[illegible]	97,166	98,845	13,578	1,281
	2,594,770	1,326,864	971,663	787,468

Last year no ore came from Sweden which even during the war was a liberal supplier. It is also evident from the data that recently very little Chilean ore was imported, that from other countries having declined to only about one-eighth of what it was in 1916 or even 1913. As contrasted with the pre-war figures of 1913 the decline is marked in every detail.

Exports of iron ore have been fairly constant in the last three years, having been 1,256,431 tons in 1918 as contrasted with 1,132,313 tons and 1,183,952 tons in 1917 and 1916 respectively. In 1913 these exports were 1,042,151 tons.

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Ougree-Marihaye Steel Works in Belgium

According to a Liège paper the following is the state of the once busy Belgian iron and steel works at Ougrée, Belgium, says the *London Iron and Coal Trades Review*. Two of the four 40-ton converters have been reduced to scrap. No trace of the small steel works is to be found, and one of the two metal mixers has disappeared. Eight boilers out of the 15 have been sent to Germany, as well as the whole of the cogging mill plant, and three-quarters of the plant of the other rolling mills, a pneumatic hammer, and various other machine tools and tackle. Some of the things the Germans could not carry away they broke up in pieces. They made use of the three open-hearth furnaces, which after some repairs can be operated again about next May, provided the necessary raw materials, including refractory bricks, pig iron, and fuel can be found. Of the eight blast-furnaces which once existed, four could be made good, and two of these be blown in about next May, and turn out daily 200 to 300 tons of pig iron, if the necessary raw materials were forthcoming.

Labor Unrest Exists in Many Districts

Government Officials Are Helpless—Cleveland Statistics Revised—Strike in Pacific Coast Shipyards Ended by Vote of the Men

WASHINGTON, March 11.—Governmental efforts to relieve the unemployment situation have made no noticeable impression. The approach of spring, however, is raising the hope here that outdoor construction work will absorb much of the present unemployed labor. It is this that is causing the Government pressure on material prices, in the belief that lower costs will accelerate building, even though there is no similar likelihood of lower wage costs.

The worst feature of the situation, however, continues to be the general prevalence of labor unrest, with increasing strikes and threats of strikes. Apparently the Government officials are helpless against this tendency, and the Department of Labor has devoted so much of its energies to inducing employers to yield to labor that it now finds itself unable to wield any influence on the workers to prevent their continuing to increase their demands.

Even more dangerous to general business and industrial conditions is the conflict which has arisen between Postmaster-General Burleson and the operators and electrical workers of the telephone lines of the country. A countrywide strike is declared to be imminent, chiefly over the contention of Postmaster-General Burleson that as long as the telephone lines are in Government hands the operators have no right to use strikes to force the Government to accede to their demands.

The Department of Labor reports that it succeeded in preventing a threatened strike of sheet metal workers in 14 Atlantic City concerns. This dispute is being adjusted. The department also reported a settlement of the trouble in the Utah copper districts.

Adjustment is reported of the strike of machinists of the Wright Lathe Co., Chicago; the wage controversy between the Rochester, N. Y., Railway & Light Co. and the engineers and firemen in its power plant, and the controversy between retail clerks and merchants in Cœur d'Alene, Idaho.

Employment of Soldiers

The employment of returned and demobilized soldiers is also causing much trouble. The United States Employment Service has not made much of a dent in this problem and Secretary of War Baker has appointed Arthur Woods, former Police Commissioner of New York, in an attempt to find places for the regiments of men who must be put to work. The various chambers of commerce of the United States are to be asked to aid in this task, and Mr. Wood will meet the secretaries of a series of these organizations in Washington on Friday in the offices of the United States Chamber of Commerce.

Mr. Woods is also to co-operate with the Employment Service in carrying out this task, although there seems some doubt about just how much of the Employment Service will be left at that time. The failure of Congress to renew the appropriation for that service has left it with a depleted treasury. Unless it can secure money from some other fund—there seem to be a lot of war funds around Washington that continually tempt diversion to other lines—the Employment Service will have to scrap most of its machinery about April 1. It probably will hold onto the chief offices throughout the country, and attempt to accomplish whatever it can by co-operating with State and municipal employment services.

The Cleveland Situation

In the meantime the Employment Service is still compiling figures to show a serious situation in the unemployment totals. For the last week, however, the service succeeded in pushing down the total by taking 15,000 off the 75,000 unemployment credited to Cleveland. This is the result of a vigorous protest that has been made by Cleveland interests against the repeated report of the Employment Service that Cleveland had 75,000 men on her unemployment list. This figure was particularly large in the light of the fact that the Employment Service credited New York, Chicago and other large cities with a demand for labor equal to the supply. There seemed no reason for singling out Cleveland for a total that approximated 20 per cent of the entire unemployment registered by the service in the United States.

Whether the drop from the estimate of 75,000 to 60,000 will satisfy the Cleveland complainants remains to be seen. Probably it will not. The difficulty with all of the figures made public by the service is that they represent little more than estimates. Apparently the estimates also are made with little reference to each other, so that it cannot be said that the totals compiled by the service are more than indexes to a general situation.

The latest figures of the service show a total excess of workers over positions of 356,566. A week ago the total was 365,400. The number of cities reporting a surplus of labor has dropped from 80 to 77, while the number of cities reporting a shortage is 11 and 33 report an apparent equality between supply and demand.

There is little in the general tabulation of figures to indicate a decided trend or to reveal centers of unemployment that show conditions to be more serious than at other places. The South still continues to present considerable areas of labor shortages. But in almost every case this is due to the refusal of the colored labor to return to agricultural and lumber industries.

Seattle Strike Ended

SEATTLE, WASH., March 11—(*By Wire*).—The strike of shipyard and allied industrial workers in Seattle, Tacoma and Aberdeen, involving about 30,000 workers in Seattle and 15,000 in Tacoma and Aberdeen, in effect since Jan. 21, was brought to an end March 9 by a referendum vote of strikers on the question of returning to work. The strikers returned to work to-day, receiving pay designated by Macy Board which was in effect previous to strike. The strikers were asking for a basic shipyard wage of $6 to $8 per day. Out of 46 metal unions in three cities, only four voted to continue. Similar action will be taken by the Metal Trades Association, an organization composed of owners of 72 foundries, machine and pattern shops, all having been affected by the strike.

With the expiration of the Macy award, by agreement on March 31, individual shipyards and contract shops will be required to treat with their own employees as regards hours, wages and working conditions. Shipyard owners, however, have been notified by the Emergency Fleet Corporation that the construction of vessels contracted for will be stopped, should employers concede pay to employees disproportionate with existing conditions, which would mean increased cost of the Government shipbuilding program.

Not Many Coke Workers Idle

UNIONTOWN, PA., March 11.—Notwithstanding the fact that the Connellsville coke region is operating generally upon a 50 per cent output, no unemployment situation has made its appearance to add to the difficulties of the operators in the present delicate situation. That situation has been met by repairs being made at a number of the larger operations, badly needed but long delayed because of the wartime capacity operation. Many workmen laid off from the mine or ovens have

been employed at that work. The advantages of that policy are twofold—it keeps working forces intact for the era of boom business which all operators believe will come when business gets adjusted; it prepares the plants for that period and keeps labor satisfied and working. In some instances operators have been forced to reduce their payrolls, but the number of unemployed men in the region at the present time is considered remarkably low, considering the rapid decrease in productive capacity of all mines.

Labor Notes

Effective March 1, the New York Air Brake Co., Watertown, N. Y., closed its plant for a period of about one week for the reorganization of its working force. It is understood that the plant will operate in the future as an open shop. About 2000 men are affected.

Mill operators at Youngstown, Ohio, expect a heavy exodus of foreign workmen as soon as the peace treaty is signed. Many such employees are applying at steamship companies for passage. For the first time in over four years many Hungarian, Slovak and Croatian employees are receiving mail from their relatives in Europe.

For the purpose of readjusting its schedule to provide work for returning soldiers, the Sharon Steel Hoop Co. has inaugurated an 8-hr. day at its steel plant in Lowellville, Ohio. This schedule takes the place of 10 and 12-hr. turns. Sheet mills of the company at Haselton, following an established custom in this division of the trade, have been operated on an 8-hr. day. Other plants in the district are contemplating adoption of the 8-hr. day in departments where unusual physical exertion is required of the employees.

Cromwell Steel Co. to Resume

The plant of the Cromwell Steel Co., Lorain, Ohio, has been leased to J. C. Cromwell for a period of 99 years, and Mr. Cromwell will operate it in his name and expects to start it up April 1. At the start the product in steel bars 3 to 8 in. in diameter, both in carbon steel and various alloys, will go largely to manufacturers of seamless steel tubing. The present organization of the company will remain intact. The plant was built about two years ago by Mr. Cromwell, who was at the head of the Cromwell Steel Co. until September, 1917, when it was reorganized, and George H. Beaumont of Pickands, Mather & Co., Cleveland; R. L. Ireland, formerly a member of M. A. Hanna & Co., and Max McMurray, who severed his connection with M. A. Hanna & Co. at the time, became affiliated with the company. Mr. McMurray was elected president, but severed his connection with the company several months ago. Under the reorganization Mr. Cromwell remained with the company as a director. The Cromwell Steel Co. will close its offices in the Leader-News Building, Cleveland, and Mr. Cromwell will maintain his executive offices in the Guardian Building, in that city. The operating offices will be in Lorain. W. S. Greenawalt has been appointed open hearth superintendent of the plant. He has been connected for the past year or two with the Erie City Forge Co., Erie, Pa., in a similar capacity, and was formerly open hearth superintendent of the Pennsylvania Steel Co., Pittsburgh Steel Co. and American Iron & Steel Co. The Cromwell steel plant consists of four 90-ton open hearth furnaces, a steam hammer for breaking down ingots, and a 30-in. roughing and finishing mill. The mill was closed down last May by direction of the Government, which diverted the ingots to other steel plants. The open hearth department has been closed since about Jan. 1.

Will Honor Mr. Schwab

All Bethlehem, Pa., wherein is located one of the chief plants of the great Bethlehem Steel Co., is preparing to honor Charles M. Schwab for his splendid services to the nation during the period in which the United States was engaged in war. The event will take place some time in April. At that time, a large public reception will be tendered to Mr. Schwab and a handsome gold medal, illustrative of historic events.

Lake Superior Iron Ore Shipments

Statistics collected by the *Iron Trade Review* show that rail shipments of iron ore from mines in the Lake Superior district in 1918 aggregated 1,679,350 tons, bringing the total movement for the year up to 62,836,082 tons. Last year's shipments showed a loss of 1,600,921 tons from 1917 when 64,437,003 tons were forwarded. The decrease from the record year of 1916, when shipments were 66,658,466, amounts to 3,822,384 tons. Last year showed a decline of 2.48 per cent from 1917, which had registered a decrease of 3.33 per cent from 1916 movement, which in turn had shown a gain of 41.01 per cent over 1915.

Comparative Shipments by Ranges, 1918-1917

	1918	1917	Decrease
Mesaba	40,396,711	41,445,211	1,048,500
Menominee	6,378,698	6,045,750	*332,948
Gogebic	7,936,701	7,981,684	44,983
Marquette	4,354,207	4,874,150	519,943
Vermillion	1,192,908	1,530,692	337,784
Cuyuna	2,478,800	2,422,884	*55,916
Mayville and Baraboo	98,057	136,632	38,575
Totals	62,836,082	64,437,003	1,600,921
By lake	61,156,732	62,498,901	2,221,463
By rail	1,679,350	1,938,102	*620,542

*Increase.

Lake shipments of iron ore in 1918 totaled 61,156,732 tons, as against 62,498,901 tons in 1917, a loss of 1,342,169 tons. The all-rail movement was 1,679,350 tons, a decrease of 244,918 tons compared with the record movement by rail of 1,924,268 tons in 1917. Rail shipments last year showed the lowest total since 1915. The following table gives the record of shipments by rail since 1908:

All Rail Shipments

	Gross Tons		Gross Tons
1918	1,679,350	1913	876,638
1917	1,938,102	1912	785,769
1916	1,924,268	1911	662,719
1915	953,947	1910	813,639
1914	707,829	1909	903,270

Of the total tonnage moved from the Lake Superior district, independent companies are credited with 58.34 per cent, or 16.68 per cent more than the shipments of the United States Steel Corporation. In 1917 the independents forwarded 55.66 per cent, and in 1916, 52.48 per cent. The 1918 figure exceeds 1917 by 2.68 per cent and is the highest on record since the formation of the Steel Corporation. Last year was the seventh successive year in which the independent companies have moved more than one-half of the ore shipped from the Lake Superior district.

Iron ore shipments from the Mesaba range in 1918 amounted to 40,396,711 tons, as against 41,445,211 tons in 1917, a loss of 1,048,500 tons. Its percentage of the total shipments was 64.29, or practically the same as the 1917 percentage of 64.32.

Large Decline in Steel Corporation Orders

Unfilled orders on the books of the United States Steel Corporation Feb. 28 were 6,010,787 tons, compared with 6,684,268 tons on Jan. 31. This is a decline of 673,481 tons, and compares with a decline in January of 694,884 tons and of 745,511 tons in December, 1918. The decline, therefore, in the last three months has been 2,113,876 tons. The unfilled orders a year ago, Feb. 28, 1918, were 9,288,453 tons. The table below gives the unfilled tonnage for the Steel Corporation at the close of each month beginning with January, 1916:

	1919	1918	1917	1916
January	6,684,268	9,477,853	11,474,054	7,922,767
February	6,010,787	9,288,453	11,576,697	8,568,966
March		9,656,404	11,711,644	9,331,001
April		8,741,882	12,183,083	9,829,551
May		8,337,623	11,886,591	9,937,798
June		8,918,866	11,383,287	9,640,458
July		8,883,801	10,844,164	9,593,592
August		8,759,042	10,407,049	9,660,357
September		8,297,905	9,833,477	9,522,584
October		8,353,293	9,009,675	10,015,260
November		8,124,663	8,897,106	11,058,542
December		7,379,152	9,381,718	11,547,284

Iron and Steel Markets

DEFER PRICE CONFERENCE

Reduction of $5 a Ton Under Discussion

New Business Much Less Than the February Rate of Production

All interest centers in the conference on prices between the steel makers' committee and the Industrial Board at Washington, which has been postponed to Wednesday, March 19. While some skepticism persists in the trade, there is general willingness to follow the Government's lead.

The amount of the probable reduction in finished material has been widely discussed. Meanwhile new business, for some time meager, has well nigh dropped out of the reckoning in certain lines.

Sentiment, as developed at a meeting of the steel committee in New York, Tuesday, which adjourned for one week, leans to a reduction of $5 per ton on leading rolled products. Iron ore and pig iron interests have moved this week for separate representation on the general committee and this has been granted.

The country's large output of steel in February has been held up as proof that conditions in the industry are more favorable than has been represented. The fact is that the February rollings of the Steel Corporation and those for January represented considerable tonnage, much of it rails, booked in 1917 at low prices, deliveries on which were suspended to make way for war orders.

New business has come in in the past few weeks at only a fraction of the February rate of operations. With most independent companies March orders have not been over 20 per cent of capacity. It is also to be considered that in some districts, notably Pittsburgh, large rollings for stock were made in January and February.

It is thus to be expected that output will fall off in March and April, with progressive reductions in working forces at steel works and rolling mills.

The attitude of foreign buyers continues to be that of the buyer at home, only absolute needs being provided for and stocks being kept down. Under the new price fixing, our export market will still be a law to itself. How long the American export level can be kept above the domestic market is a question, with British Government price fixing expiring in less than two months. British exports may then be more closely competitive with American steel, with the added advantage of lower ocean freights.

In this connection interest attaches to the expressed desire of British steel manufacturers to make some form of agreement with their competitors in this country in respect to the export trade. Presumably the Webb act would give sanction to such an arrangement, but no interest has been shown in it on this side and there is no likelihood of any early action.

Few transactions actually anticipating lower prices are noted, but they were hardly to be expected, with the brake put on negotiation by the pending deliberations at Washington. Foundry pig iron in the Pittsburgh district is the conspicuous exception. There sales have been made at $28, or $3 below the ruling scale, but they are explained as coming out of furnace stocks which earlier buyers now decline to take.

A further recession is noted in blast furnace coke, March deliveries now being obtainable at $4 per net ton, a reduction of 25c.

Hard steel bars for reinforcing purposes are quoted in the Middle West at 2.35c., or $5 to $7 per ton below the general price.

After weeks of better demand than was shown for most forms of finished steel, slackness has overtaken the sheet and tin plate trades. Some sheet mills are now down to a 50 per cent operation rate. In Cleveland one mill is shading black sheets $1 per ton and some sheets have been sold at a plate base, corresponding to a $4 cut.

Some pending Government structural projects are now authorized, notably the armor plate plant at Charleston, W. Va., for which the American Bridge Co. will supply 25,000 tons. Hangars at Hampton, Va., take 1000 tons, largely of light sections.

Pittsburgh

PITTSBURGH, March 11.

Great interest is being shown by the trade here as to what will be recommended in the way of lower prices through the meeting with the Industrial Board of the Department of Commerce of the steel trades representatives. Three or four of the heads of leading steel companies here believe a very radical reduction in prices should be made, if anything definite is to be accomplished in the direction of getting business started again. It is pointed out that a reduction of $3 to $5 per ton would not have the desired effect and that the only thing to do is to make a radical cut that will cause the consumer to believe it is safe for him to anticipate his needs.

It is also believed labor will be allowed to take care of itself. The point is that if a radical cut is made in steel prices many plants will have to close down, as their costs will not allow them to meet these lower prices. This will mean a large number of men thrown out of work, thus labor prices later on will be a good deal lower than they are now.

In the meantime the whole steel trade is simply marking time, and no one is buying a pound of anything that he can get along without. In fact, it is known that some of the larger steel companies have advised their customers to hold off placing business until the situation becomes clearer. Against this it is also known that a good deal of business has been offered the different steel companies at whatever prices may be finally agreed upon. There is a steady decrease in output of pig iron, and the rate of operation among the steel plants and finishing mills is lower this week than last week, and there will be a still further falling off unless there is soon a heavy demand for steel. It is known that a good part of the output for the past six weeks or two months has gone into stock, but there is still a strong belief that when the steel business does

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, per Gross Ton:	Mar. 11, 1919	Mar. 4, 1919	Feb. 11, 1919	Mar. 13, 1918
No. 2 X, Philadelphia‡	$36.15	$36.15	$36.15	$34.25
No. 2 Valley furnace†	*28.00*	31.00	31.00	33.00
No. 2 southern, Cin'ti†	34.60	34.60	34.60	35.90
No. 2 Birmingham, Ala.†	*29.00*	31.00	31.00	33.00
No. 2 furnace, Chicago*	31.00	31.00	31.00	33.00
Bess. del., eastern Pa.	33.90	33.90	33.90	33.75
Bess. Valley furnace	30.00	30.00	30.00	33.00
Bessemer, Pittsburgh	33.60	33.60	33.60	37.25
Malleable, Chicago*	31.50	31.50	31.50	33.50
Malleable, Valley	31.50	31.50	31.50	33.50
Gray forge, Pittsburgh	....	31.40	31.40	32.75
L. S. charcoal, Chicago	38.85	38.85	38.85	37.50
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	$55.00	$55.00	$55.00	$55.00
O-h rails, heavy, at mill	57.00	57.00	57.00	57.00
Bess billets, Pittsburgh	43.50	43.50	43.50	47.50
O-h billets, Pittsburgh	43.50	43.50	43.50	47.50
O-h sheet bars, P'gh	47.00	47.00	47.00	51.00
Forging billets, base, P'gh.	56.00	56.00	56.00	60.00
O-h billets, Philadelphia	47.50	47.50	47.50	50.50
Wire rods, Pittsburgh	57.00	57.00	57.00	57.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Common iron bars, Phila.	3.145	3.145	3.145	3.685
Common iron bars, P'gh.	2.90	2.90	3.50	3.50
Iron bars, Chicago	2.92	2.92	2.97	3.50
Steel bars, Pittsburgh	2.70	2.70	2.70	2.90
Steel bars, New York	2.97	2.97	2.97	3.095
Tank plates, Pittsburgh	3.00	3.00	3.00	3.25
Tank plates, New York	3.17	3.17	3.27	3.445
Beams, etc., Pittsburgh	2.80	2.80	2.80	3.00
Beams, etc., New York	3.07	3.07	3.07	3.195
Skelp, grooved steel, P'gh.	2.70	2.70	2.70	2.90
Skelp, sheared steel, P'gh.	3.00	3.00	3.00	3.25
Steel hoops, Pittsburgh	3.30	3.30	3.30	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Mar. 11, 1919 Cents	Mar. 4, 1919 Cents	Feb. 11, 1919 Cents	Mar. 13, 1918 Cents
Sheets, black, No. 28, P'gh.	4.70	4.70	4.70	5.00
Sheets, galv., No. 28, P'gh.	6.05	6.05	6.05	6.25
Wire nails, Pittsburgh	3.50	3.50	3.50	3.50
Cut nails, Pittsburgh	5.00	5.00	5.00	4.00
Fence wire, base, P'gh.	3.25	3.25	3.25	3.25
Barb wire, galv., P'gh.	4.35	4.35	4.35	4.35
Old Material, Per Gross Ton:				
Carwheels, Chicago	$21.00	$21.00	$23.00	$30.00
Carwheels, Philadelphia	23.00	23.00	23.00	30.00
Heavy steel scrap, P'gh.	14.00	14.00	15.00	30.00
Heavy steel scrap, Phila.	13.75	14.00	15.00	29.00
Heavy steel scrap, Ch'go	15.00	15.00	15.00	29.50
No. 1 cast, Pittsburgh	18.00	18.00	19.00	30.00
No. 1 cast, Philadelphia	21.00	21.00	23.00	30.00
No. 1 cast, Ch'go (net ton)	**21.00**	20.50	19.50	26.75
No. 1 RR. wrot, Phila.	20.00	20.00	23.00	35.00
No. 1 RR. wrot, Ch'go (net)	15.50	15.50	15.00	30.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$3.00	$4.25	$4.25	$6.00
Furnace coke, future	5.00	6.00	6.00	6.00
Foundry coke, prompt	5.00	5.00	5.00	7.00
Foundry coke, future	5.50	7.00	7.00	7.00
Metals, Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	15.75	15.75	18.50	23.50
Electrolytic copper, N. Y.	15.00	15.00	18.00	23.50
Spelter, St. Louis	6.45	6.25	6.50	7.50
Spelter, New York	6.50	6.60	6.85	7.75
Lead, St. Louis	5.00	5.00	4.70	7.10
Lead, New York	5.25	5.25	5.00	7.25
Tin, New York	72.50	72.50	72.50	85.00
Antimony (Asiatic), N. Y.	7.00	7.12½	7.12½	13.25
Tin plate, 100-lb. box, P'gh.	$7.35	$7.35	$7.35	$7.75

open up the demand is going to be very heavy and will tax the capacity of the mills to meet it.

Pig Iron.—It is pretty well established that there would be no trouble in buying No. 2 foundry iron on the basis of $28 at Valley furnace, equal to $29.40 Pittsburgh. In fact, sales have been made at this price—these of iron piled at several Valley furnaces that are now banked on account of lack of orders. This iron is all under contract to consumers, but has not been taken out, and it is the probable intention of these furnaces to charge to consumers who bought the iron the difference in the price they were to pay for it and what the iron had to be sold for in the open market. It is said that in some cases this amounts to as much as $6 per ton, and quite a number of lawsuits are looming up as a result. A number of furnaces in the two Valleys are either banked or blown out, as they have no orders and do not care to pile iron at present high cost. The Shenango Furnace Co. is operating only one of its three furnaces at Sharpesville, Pa., the two idle stacks having been repaired and relined, and are all ready to start but have no iron sold on which to operate. There is no new demand for Bessemer or basic iron, and beyond a few small sales of carloads up to 100 tons there is nothing doing. The general belief is there will be a radical cut made in prices as a result of the meeting in Washington next week. Some in the trade put this at as much as $10 per ton. Prices in effect at this writing are as follows:

Basic pig iron, $30; Bessemer, $32.20; gray forge, $30; No. 2 foundry, $31; No. 3 foundry, $30.50; and malleable, $31.50, all per gross ton at Valley furnaces, the freight rate to Cleveland and Pittsburgh districts being $1.10 per ton.

Ferroalloys.—New demand is quiet and any sales are mostly made by consumers, who have too much stock on hand. There have been resales of ferromanganese and 50 per cent ferrosilicon at relatively low prices. Manufacturers of ferromanganese recently fixed the price of 80 per cent at $150, delivered, and allowing a reduction of $3 per unit, would make 70 per cent ferromanganese $120 per ton delivered. There seems to be no doubt but that ferromanganese and ferrosilicon could both readily be bought on resale at the above-named prices.

We quote 70 per cent resale ferromanganese at $120, delivered, and 16 to 18 per cent spiegeleisen, $59, f.o.b. furnace, an addition or deduction of $3.50 per unit being made when the manganese content is above or below the standard. Fifty per cent resale ferrosilicon is quoted at $90 to $100, delivered.

We quote 9 per cent Bessemer ferrosilicon at $52; 10 per cent, $54; 11 per cent, $57.30; 12 per cent, $60.60. We quote 6 per cent silvery iron, $39; 7 per cent, $40; 8 per cent, $42.50; 9 per cent, $44.50; 10 per cent, $47. Three dollars per gross ton advance for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, these furnaces having a uniform freight rate of $2.90 per gross ton, for delivery in the Pittsburgh district.

Billets and Sheet Bars.—No sales have been made and it is not likely anything will be done in the way of making new deals until it is known what action is taken at Washington next week in regard to prices. The slackness in operations of the sheet and tin plate mills has cut down the consumption of sheet bars materially, and some of the steel mills are not operating at more than 50 per cent. Prices in effect are as follows:

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $43.50, sheet bars $47, slabs $46, and forging billets $56 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Structural Material.—It is announced that active work on the Government armor plate plant at Charleston, W. Va., which has been held up for some time, will now go forward, and work on this plant is to be pushed to completion. The American Bridge Co. has the contract for the steel, upward of 25,000 tons. This steel is to be fabricated at its Ambridge, Pa., works, and the plant, which has been running only about four days per week, is expected to go on full time about next Monday. General inquiry is quiet and no jobs of importance are in sight. Local fabricating plants are operating only to about 50 per cent of capacity or less. There is a good

deal of foreign inquiry and reports are that the Steel Corporation is to establish a number of warehouses in France and Belgium.

We quote beams and channels up to 15 in. at 2.80c. at mill, Pittsburgh.

Plates.—There is no new buying in plates except for urgent need and this is only for small lots for prompt shipment, some mills being able to ship out in two or three days from date of order. Lower prices on plates seem to be on the way and in fact there have already been sales of plates at as low as 2.85c., Pittsburgh, and 2.90c. has been more frequent. A material reduction in prices of plates is looked for next week. The nominal price of ¼ in. and heavier sheared plates is 3c., at mill, Pittsburgh, but this price has recently been shaded $2 to $3 per ton.

Iron and Steel Bars.—Several of the larger steel bar mills are fairly comfortable with orders but other mills have very little business on their books and are not operating to more than 50 per cent capacity. The new demand for iron bars is dull and prices are weak. No new buying is being done except for urgent needs. Nominal prices in effect at this writing are: Steel bars rolled from billets 2.70c.; from old steel rails 2.80c.; and common iron bars 2.70c. for Western shipment and 2.90c. for Eastern shipment, all f.o.b. Pittsburgh.

Sheets.—Makers report that the new demand has fallen off very much recently, the whole consuming trade looking for the lower prices promised. Independent sheet mills are working at about 60 per cent of capacity, but some at a less rate. The new demand for cold rolled sheets for automobile purposes has been quite heavy, and some mills are sold up on the grade for the next two or three months. It is remarkable how well prices on sheets have held, in view of the light demand that has existed for some time. Mill prices on sheets in effect at this writing are given on page 720.

Tin Plate.—It is very likely that a reduction in the price of tin plate will result after the meeting in Washington next week, and there is no new buying except in small lots for actual needs and for prompt shipment. No large consumers have made contracts for their supply for the first half of this year, having a good deal of tin plate due them on contracts made last year and which were not completed. Some of the trade believe there will be a radical cut in the price. The consumption this year promises to be very heavy, and may exceed that of last year. The nominal price at this writing remains at $7.35 for base box, Pittsburgh. New demand for terne plate is dull, owing to the light building operations all over the country. Present prices on terne plate are given on page 720.

Wire Rods.—New inquiry is only fair, but there is a good deal of export inquiry, on which the mills have been quoting about domestic prices for some time. We note sales of 700 to 1000 tons of No. 5 soft rods at $57 at mill, while high carbon rods range from $65 up to $85 or higher, depending on carbon. Present prices on rods are given on page 720.

Wire Products.—The trade is pretty well satisfied that prices on wire and wire nails are going to be lower as a result of the meeting in Washington next week, and new orders being placed are only for small lots to meet urgent needs. It is said the Navy Department has decided not to buy the 20,000 kegs of wire nails for which it inquired recently, but will wait until it is known what will be done with prices, in spite of the fact that makers of wire and wire nails have contended right along that even present prices do not allow a fair margin of profit. Recently, however, there has been some shading of prices. Prices now in effect on wire products are given on page 720.

Hot Rolled Strip Steel.—Mills report little new demand and only for small lots to meet actual needs and for prompt delivery. A reduction in prices may come as a result of the conference in Washington. Mills are operating only to about 50 per cent of capacity, or less, owing to the dull demand. Prices in effect at this writing are as follows:

We quote hot-rolled strip steel, as made by hoop and band mills, at 3.30c. per lb., while for deep stamping or drawing quality steel, 50c. per 100 lb. extra is charged, all f.o.b. Pittsburgh.

Cold Rolled Strip Steel.—The only new buying being done is for small lots to meet urgent needs, consumers holding off waiting for the lower prices. Prices now in effect are as follows:

We quote cold-rolled strip steel at $6.25 base per 100 lb., f.o.b. Pittsburgh, for 1½-in. and wider, 0.100 in. and thicker hard tempered in coils under 0.20 carbon. Boxing charge 25c. per 100 lb.

Nuts and Bolts.—New demand is very light, jobbers and consumers alike waiting for lower prices. Discounts have been more or less shaded for some time, depending largely on the order. Some makers have been absorbing the full freight, while others have been giving a straight 5 or 10 per cent cut. Nominal discounts, which are not minimum of the market, are given on page 720.

Shafting and Screw Stock.—Nearly all the new buying in shafting recently has been done by the automobile trade, the demand from the implement makers and from the screw stock machine people having been light. As a rule, makers of shafting are operating to only 50 per cent of capacity or less, but claim they are holding regular discounts firm. Present discounts are as follows:

We quote cold-rolled shafting at 21 per cent off list in carloads and 16 per cent in less than carloads, f.o.b. Pittsburgh.

Rivets.—New demand is very light, consumers holding off placing orders, waiting for lower prices.

We quote button head structural rivets at $4.20 and cone head boiler rivets at $4.30 base, f.o.b. Pittsburgh.

Spikes.—The Louisville & Nashville Railroad, which recently sent out an inquiry for 7500 kegs, has cut this quantity in about one-half and is said to have divided about 3500 kegs between two makers. New demand is very dull.

We quote standard spikes, 9/16 x 4½ in., at $3.65 and small spikes at the same price in carload lots of 200 kegs or more at $3.65 per 100 lb., plus usual extras. We quote boat spikes at $5.00 base per 100 lb. plus usual extras in carload lots of 200 kegs or more, all f.o.b. Pittsburgh.

Hoops and Bands.—New demand is only for small lots to meet urgent needs, the trade waiting for lower prices. The present prices are as follows:

We quote steel hoops and bands at 3.30c. base, with the usual extras.

Wrought Pipe.—New demand for lap weld sizes for both iron and steel pipe has quieted down a good deal recently, the trade evidently waiting for lower prices. Mills are operating at 75 per cent or better of capacity, but a good part of the pipe being rolled is going into stock to meet the expected heavy demand to come later. Present discounts on iron and steel pipes are given on page 720.

Boiler Tubes.—There is a fair demand for locomotive tube, but other grades are very dull. Lower prices on tubes are looked for, but present discounts are given on page 720.

Coke.—A good many running contracts have been adjusted to the basis of $4.25 up to $4.75 per net ton for March shipment, but the lower price has largely ruled in most of these adjustments. Standard grades of blast furnace coke have been freely offered in the past few days at $4 per net ton, at oven, and some grades have been offered as low as $3.75. We quote standard makes of blast furnace coke for March shipment at $4 to $4.25, and standard makes of 72-hr. foundry coke at about $5 per net ton at oven. Output of coke in the Upper and Lower Connellsville regions for the week ended March 1 was 224,872 tons, a decrease over the previous week of about 9000 tons.

Old Material.—Local conditions in the scrap trade have not shown any betterment, except that there is a heavier demand for turnings, these having been bought very freely by blast furnace companies in the past sev-

eral weeks. In addition, recent buying of turnings by the Bethlehem Steel Co., in the East, as reported in THE IRON AGE, has stopped shipment of turnings from Eastern territory into the Pittsburgh district, which had been heavy. The result is that the visible supply of turnings has been pretty well cleaned up, prices being firmer, and from 50c. to $1 per ton higher. On the other grades of scrap there is very little demand, but the belief is growing that possibly prices of scrap are about as low as they will go. Several local dealers say they are going to pile scrap very heavily in their yards from now on, and in addition, producers of scrap say that, rather than sell it at present low prices, they will pile it in their yards and wait for a higher market. A good part of the scrap contained in the Pennsylvania Railroad Lines East, on which bids were opened March 11, has been bought by dealers who will pile it. It is still very difficult to quote prices, as so little material is moving from dealers to consumers. We note a sale of 1000 tons of rerolling rails at $15 delivered, and also a sale of 1000 tons of heavy melting steel scrap at about $14.50 delivered. Prices quoted by dealers to consumers for delivery to mills in the Pittsburgh district, and other consuming points that take Pittsburgh freights, are as follows:

Heavy steel melting, Steubenville, Follansbee, Breckenridge, Monessen, Midland and Pittsburgh, delivered	$14.00 to $15.00
No. 1 cast, for steel plants (nominal)	18.00 to 19.00
Bonding rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	15.00 to 16.00
Compressed steel	11.00 to 12.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	11.00 to 12.00
Bundled sheet stamping	10.00 to 10.50
No. 1 busheling	13.00 to 14.00
Railroad grate bars	14.00 to 15.00
Low phosphorus melting stock	16.00 to 17.00
Low phosphorus melting stock (bloom and billet ends, heavy plates)	19.00 to 20.00
Iron car axles	31.00 to 32.00
Locomotive axles, steel	29.00 to 30.00
Steel car axles	31.00 to 32.00
Railroad malleable	13.00 to 14.00
Machine shop turnings	9.50 to 10.00
Cast iron wheels	21.00 to 22.00
Rolled steel wheels	16.00 to 17.00
Sheet bar crop ends (at origin)	19.00 to 20.00
Heavy steel axle turnings	11.00 to 12.00
Heavy breakable cast	18.00 to 19.00
Cast iron borings	9.50 to 10.00
No. 1 railroad wrought	18.00 to 19.00

Wages of Sheet Mill Workers Reduced

YOUNGSTOWN, OHIO, March 12.—Wages of sheet mill operatives will be cut 10½ per cent and tin mill workers 11 per cent for the March-April period from the January-February rate as the result of the bimonthly settlement to-day, by representatives of the National Association of Sheet and Tin Plate Manufacturers and the Amalgamated Association of Iron, Steel and Tin Workers. Examination of selected sales sheets showed an average sales price of $4.90 for Nos. 26, 27 and 28 gage black sheets as compared with $5.25 two months earlier. The average price per box for coke tin plate was $7.45 as against $7.85 at the last settlement. During the war, the peak price of sheets was $5.50 and of tin plate $8.60.

Steel Companies Combine

YOUNGSTOWN, OHIO, March 12—(*By Wire*).—The consolidation of the Trumbull Steel Co. with the Liberty Steel Co., both of Warren, Ohio, is announced. The Trumbull Steel Co. has taken an option on a majority of the common stock of the Liberty Steel Co. at $130 per share, to be paid for in Trumbull preferred at par. President Edward F. Clark of the Liberty Company has written letters to stockholders advising them to accept the offer. The Trumbull company will take over the Liberty plant, which consists of eight sheet mills, on July 1 next. The Liberty company has been operating less than a year and the Trumbull company has always been a heavy stockholder in it.

Many Youngstown Plants Idle

YOUNGSTOWN, OHIO, March 12.—Unemployment reached a peak in the Youngstown district this week, idle mills reflecting the unwillingness of buyers to come into the market under present conditions. The Republic Iron & Steel Co. has its entire finishing department, the Brown-Bonnell mills, idle, and the Bessemer works. All 15 sheet mills of the Youngstown Sheet & Tube Co. are down. The Mahoning Valley plant of the Sharon Steel Hoop Co. was down completely the first two days, six mills resuming Wednesday.

Birmingham

BIRMINGHAM, ALA., March 10.

Pig Iron.—There have been a few sales of Birmingham iron in strictly competitive territory at $29. This was in the Central West and was induced by competitive proffers of like tonnage to identical parties. It is purely a matter of meeting the freight rate or not doing business. It is probable that an entering wedge in this direction will result in a considerable cleavage of the $31 price. However, the $31 level applies to all Southern business and to all points where there is equality in the freight rates; hence those not in a position to utilize these conditions need not apply. Agents of iron makers are instructed to ask $31 and anything done under that is under strictly competitive pressure. There have been no more blowing out of stacks since the Sloss-Sheffield Steel & Iron Co. shut down one at Sheffield and one in Birmingham, reducing its active list to three. All companies admit stacking some iron even under reduced operations. There have been several export inquiries, but freights are too high. A New Orleans vessel offered $40 to Genoa. That is a sample. Special criticism applies to the $20 rate to Britain with $15 to the Orient. There have been common labor reductions at a few points and they were accepted without protest. Superior efficiency was splendidly demonstrated in February, a month of 28 days, during which 22 active stacks produced 4000 more tons of iron than 28 active stacks did in the 31-day month of January. Incompetent and raw labor has been dropped and men still on the payroll show greater appreciation of the job. All raw material, especially coke, is of superior quality compared with that of 1918. We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, 1.25 to 2.25, silicon	$29.00 to $31.00
Basic	30.00

Cast Iron Pipe.—The water and sanitary pipe trade continues to maintain a waiting game. Orders come by spurts and plants purchase pig iron for prompt delivery according to the volume of business.

Coal and Coke.—Hand-picked 72-hr. foundry coke has been reduced from $9.75 to $9 in response to competition and the smaller demand as compared with the output. Here, as in other lines, foundries purchase only for prompt delivery. Many coal mines are operating only three days in the week and some ore mines have closed down. Labor surplus is not yet marked and much of it will find its way back to the farms.

Old Material.—The scrap market has settled rather firmly at the recently reduced levels and for three weeks there has been no change for the worse, which leads dealers to look for a turn betterward. Very little business is going except in cast, which foundries are using to a large extent in mixtures. We quote per gross ton f.o.b. Birmingham district yards, prices to consumers, as follows:

Steel rails	$10.50 to $11.00
No. 1 heavy steel	10.00 to 10.50
Cast iron borings	6.00 to 6.50
Machine shop turnings	6.00 to 6.50
Stove plate	13.00 to 13.50
No. 1 cast	19.00 to 19.50
Car wheels	19.00 to 19.50
Tramcar wheels	18.00 to 18.50
Steel axles	28.00 to 30.00
No. 1 wrought	18.00 to 18.50

Chicago

CHICAGO, March 11—(*By Wire*).

The price discussion held in the East with the prospect of a general revision downward has acted as an effectual brake on purchasing of iron and steel. That prices will be reduced is taken for granted, the big question is how much and how long the new prices will hold good. It is emphasized that something must be done to inspire faith in whatever prices are recommended and that this can be achieved only by establishing levels that will have a reasonable tenure of life. Until some authoritative announcement is made, buyers and sellers can only wait.

It is recognized that under lower prices the mills must depend on efficient production for their profits, and this means that the employees must make good. They are more productive now than they were during the period of hostilities, but they must do even better, and the mills must be operated at a fair percentage of capacity. With the employees a day's work must be a real day's work, if the present wages are to be maintained. Mill operators say they kept going in 1914, and they can do so now, despite lower prices for steel, if the business exists and the men do their share.

The leading interest continues to run full with the leading independent at about 60 per cent. At the slow rate at which orders were booked in the past week, it would not take long to work into idleness.

The week has brought in limited price cutting to attract what little business there has been, the leading interest having had the lowest week of many years in point of business booked. Some building work is in prospect, but it does not move to fruition while the oil fields also are a prospective source of business. Jobbers' stocks are not being kept at maximum, though they endeavor to maintain a good assortment. Many consumers who ordinarily buy from the mills have lately been purchasing small lots from the jobbers. Railroad purchases now all depend on arrangements being perfected for financing the roads. The latter are borrowing rails and track fastenings from a few fortunate ones.

Lack of employment, however serious it may be elsewhere, has not reached an acute state in the Chicago district. In Gary, for instance, there are only a few hundred idle men and the Calumet district does not present a bad case, though authoritative figures are unobtainable.

Ferroalloys.—Not enough business is being done to establish authoritative price levels. Reports are current of resales of both spiegeleisen and ferromanganese at substantial concessions. Makers are firm, but the prices they name are nominal. Confirmation of the resales is lacking but there is no question about their having occurred.

We quote 70 per cent ferromanganese nominal at $175 delivered; 50 per cent ferrosilicon at $125 to $130, delivered, and 16 to 18 per cent spiegeleisen at $50, furnace.

Plates.—Except for a few scattering orders, the market is dormant. There is some prospective business in oil tanks, but not a great deal. One mill sees the end of its bookings by April 1 unless there is a change in demand.

The mill quotation is 3c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 4.27c. for plates out of stock.

Pig Iron.—As might be expected under existing conditions, very little business is being done. Occasional sales of small lots needed to fill in are all that can be pointed to, because in the iron and steel fields, consumers are waiting. Distributers see a complex situation ahead of them. They have just emerged from a trying time in which contracts have been revised on the basis of the last reduction of $3 a ton, and with another reduction in sight, they do not believe that it would be just for contracts to be further revised and they are hoping this condition will be all recognized in whatever price recommendations are made as a result of the Washington conference on March 19. The leading Northern maker has two furnaces out of blast, and a Tennessee furnace, after canvassing the situation, contemplates blowing one also. A steel plant which is running one of its furnaces on foundry instead of basic, may blow out this stack unless there is improvement in some direction, either in steel or pig iron.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 2 to 5	$38.70 to $39.00
Lake Superior charcoal, C to AA	40.70 to 42.50
Lake Superior charcoal, No. 6	41.20 to 41.50
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	44.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	43.00
Northern high-phosphorus foundry	43.00
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	49.00
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	47.50
Southern foundry, silicon, 1.75 to 2.25	46.00
Malleable, not over 2.25 silicon	43.50
Standard Bessemer	52.50
Basic	46.00
Low phosphorus (copper free)	52.50
Silvery, 7 per cent	45.80 to 47.80

Structural Material.—The fabricators have several jobs on which they are asked to figure, but it is conceded the work will not go forward except at lower prices and in a stabilized market. Some shape mills have no orders to carry them beyond the end of the month. The Hansel-Elcock Co. will fabricate 405 tons required by a refrigerator plant for Armour & Co. at the Union Stock Yards, Chicago.

The mill quotation is 2.80c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 4.07c. for material out of warehouse.

Cast Iron Pipe.—Neither inquiries nor awards can be reported. The pipe trade is hopeful for a substantially lower price on pig iron.

We quote per net ton f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $64.80; 6-in. and larger, $61.80; class A and gas pipe, $1 extra.

Bars.—No change is reported in steel bars and none is expected until the price situation clarifies. Common bar iron also is dull. There is talk of concessions having been made in iron, but 2.90c. is the lowest price confirmed. Rail carbon steel shares the common inactivity.

Mill prices are: Mild steel bars, 2.75c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.85c., Chicago; refined iron bars, 3.65 to 4.40c.; rail carbon, 2.85c., Pittsburgh.

Sheets.—Makers continue to run full on hand to mouth orders with nothing ahead, and the situation at the moment is not encouraging.

Chicago delivery out of stock regardless of quantity, No. 10 blue annealed, 5.17c.; No. 28 black, 6.22c. and No. 28 galvanized, 7.57c.

Mill quotations are 4.70c. for No. 28 black, 3.95c. for No. 10 blue annealed, and 6.05c. for No. 28 galvanized.

Rails and Track Supplies.—The roads are not buying. On the contrary they are resorting to the old expedient of borrowing rails and track fastenings from each other, so great is their need. Great hope is placed in the finding of some method of financing the roads.

Standard railroad spikes, 3.65c., Pittsburgh. Track bolts with square nuts, 4.90c., Pittsburgh. Tie plates, steel 3c., Pittsburgh and Chicago; tie plates, iron, 3.30c. f.o.b. makers' mills. The base for light rails is 3c., f.o.b. maker's mill, with usual extras.

Wire Products.—Orders are coming out in fair volume, but they are small individual lots. It is frequently requested that shipments be rushed, indicating that stocks are small. For prices see finished iron and steel, f.o.b. from Pittsburgh, page 720.

Bolts and Nuts.—The better feeling that was existent a week ago with its consequent buying has disappeared, consumers having determined to wait the result of price meeting. For mill prices, see finished iron and steel f.o.b. Pittsburgh, page 720. Jobbers quote:

Structural rivets, 5.67c.; boiler rivets, 5.77c.; machine bolts up to ⅞ x 4 in., 40 per cent off; larger sizes, 25 and 5 off; carriage bolts up to ⅞ x 6 in., 35 off; larger sizes, 25 and 5 off; box pressed nuts, square topped, 7.8c. off; hexagon tapped, 57c. off; coach or lag screws, gimlet points, square heads, 40 per cent off. Quantity extras for nuts are cancelled.

Old Material.—This market shares the general state of suspense pending the announcement of new prices for finished material. The market is considered a little firmer in that dealers are paying better prices for material. But the mills have done practically nothing. Should lower prices be made effective for finished steel and iron and activity ensue as expected, it is believed that the scrap market will not go lower, one reason being that in the scrap market low steel prices already have been discounted, while the resultant activity in scrap would tend to maintain prices. It is possible that were good round tonnages offered to consumers, somewhat better prices might be obtained for some items than those here quoted, but as yet the mills have not paid more. One influence in holding down prices in Chicago is the depression in the Eastern market which may cause Eastern scrap to come here. Plenty of rerolling rails are offered, but few are taken. Material is offered by the Monon Route, Chicago & Great Western, Wabash, Great Northern, and Soo Line.

We quote for delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	$21.00 to $22.00
Relaying rails	45.00 to 50.00
Carwheels	21.00 to 22.00
Steel rails, rerolling	16.00 to 16.50
Steel rails, less than 3 ft	15.50 to 16.50
Heavy melting steel	15.00 to 15.50
Frogs, switches and guards cut apart	15.00 to 15.50
Shoveling steel	14.50 to 15.00

Per Net Ton

Iron angles and splice bars	$19.00 to $20.00
Steel angle bars	14.00 to 15.00
Iron arch bars and transoms	22.50 to 23.50
Iron car axles	27.00 to 28.00
Steel car axles	21.00 to 22.00
No. 1 busheling	13.00 to 13.50
No. 2 busheling	8.00 to 8.50
Cut forge	14.00 to 14.50
Pipes and flues	11.50 to 12.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	14.00 to 14.50
Steel knuckles and couplers	17.50 to 18.00
Coil springs	18.00 to 18.50
No. 1 cast	21.00 to 21.50
Boiler punchings	18.00 to 19.00
Locomotive tires, smooth	16.00 to 17.00
Machine-shop turnings	5.50 to 6.50
Cast borings	8.50 to 9.00
Stove plate and light cast	15.00 to 15.50
Grate bars	14.50 to 15.00
Brake shoes	13.50 to 14.00
Railroad malleable	15.50 to 16.50
Agricultural malleable	14.00 to 14.50
Country mixed	9.00 to 10.00

Philadelphia

PHILADELPHIA, March 11.

In view of the meeting in Washington on March 19 of the American Iron and Steel Institute committee and the Industrial Board of the Department of Commerce, at which new prices for pig iron and steel products may be agreed upon, the iron and steel market, as might be expected, is stagnant. There is no buying of any consequence, nor do sellers expect that there will be any until the price question is out of the way.

The phrase, "stabilizing of prices," has been much used of late and the trade interprets this as indicating not only the need of reducing prices, but of making these reductions of such a character as will instill in the minds of buyers the firm belief that prices have reached bottom. Unless this confidence among consumers can be created, the situation will be no better than at present; this being the view of a majority of sellers. Much of the opposition to the Redfield plan, which was manifest in Philadelphia when it was first proposed, melted away at the meeting of the steel and iron producers in New York last Thursday. The extent to which prices will be reduced is a much-discussed question, the general opinion being that pig iron will be reduced to about $25 for basic, and that steel products will be cut from $5 to $10 a ton. A majority opinion favors the larger reduction, even though some of the mills which have high production costs, may be obliged to shut down for a time, until those costs can be reduced. Representatives of some of the smaller mills admit the possibility that the prices to be named will be lower than their costs, thus forcing them to shut down.

A large Eastern steel company has bought 10,000 tons of heavy melting steel at $13.75 and $14 delivered at its works and is in the market for 20,000 tons more for second quarter delivery.

Pig Iron.—Producers of pig iron predict that many Eastern merchant furnaces will be blown out if the Industrial Board of the Department of Commerce and the American Iron and Steel Institute committee agree on a substantial reduction of pig iron prices, such as $5 a ton, which is being talked about in the local trade. Basic iron at $25, it is held, would be below the costs of some of the furnaces. Concessions on foundry grades are being offered by Eastern furnaces, but the inquiries are so few in number and for such small tonnages—usually a carload or two—that there has not been much inducement for widespread reductions. Several furnaces are quoting the Pittsburgh base price f.o.b. furnace, thus eliminating the Pittsburgh to Philadelphia freight rate of $3.90, and charging only the local freight from furnace to destination, while others are making concessions on the established differentials for silicon. A few lots of foundry and Bessemer iron have been sold for export at substantial reductions. We quote for delivery in the Philadelphia district on standard grades of iron, with the exception that low phosphorus iron is quoted f.o.b. furnace:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	$36.15
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	34.90
Virginia No. 2 X (2.25 to 2.75 sil.)	36.35
Virginia No. 2 plain (1.75 to 2.25 sil.)	35.10
Basic	33.90
Gray forge	33.90
Standard low phosphorus (f.o.b. furnace)	51.00
Copper-bearing low phosphorus (f.o.b. furnace)	48.00

Ore.—A cargo of manganese ore from Brazil, totalling 2430 tons, and having a declared value of $70,470, was received at this port Monday.

Ferroalloys.—Almost no business is being done in ferromanganese or spiegeleisen, and prices for resale lots are weaker. Producers' quotations for 78 to 82 per cent ferromanganese is $200, but resale lots can be obtained at $150 or less, while offerings of 18 to 22 spiegeleisen at $43 for resale have not attracted much business. Demand for other ferroalloys is very quiet.

Coke.—No sales of importance are being made in this district. Spot foundry coke in carload lots is quoted by brokers at $6. Contracts made at $7 have been revised downward $1 a ton.

Billets.—Some of the mills are offering liberal concessions on forging billets. In one case, a small tonnage of forging billets, regularly quoted at $56, Pittsburgh, has been sold at the price for rerolling billets, $43.50, Pittsburgh. The forging companies have been sharply cutting prices of steel forgings, some reductions amounting nearly to 50 per cent, as compared with prices which prevailed up to the end of the war, and therefore the forges have been endeavoring to buy their steel much cheaper, in some cases with success. An inquiry is in the market for 5000 tons of rerolling billets for export. Domestic demand is dull. We quote open-hearth rerolling billets at $47.50, delivered Philadelphia.

Plates.—A few fair-sized inquiries, one for 3000 tons, are before the mills, indicating that a better business may develop when the question of prices has been settled by agreement between the steel manufacturers and the Industrial Board of the Department of Commerce. Operations of plate mills show variation, one or two working at a fair rate, while others have taken very little new business and have finished up their backlog of orders. A plate maker states that firm offers from consumers at 2.90c., Pittsburgh, would find ready takers among the mills. It is reported that one mill has quoted this price on one-ton lots, and would do better on a larger lot. A sale of a few carloads of boiler plates was made recently to an Eastern consumer at 2.85c., base, Pittsburgh. Opinions in the trade vary as to what the new price on plates may be.

One belief is that a cut to 2.75c. would satisfy the consuming trade and bring out business, while others believe that buyers will expect a more substantial reduction, and they lean to the view that the new price will represent about a $10 reduction. We quote sheared plates, ¼ in. and heavier, at 2.85c. to 3c., Pittsburgh, with a freight rate to Philadelphia of 24½c. per 100 lb.

Structural Material.—No important building activity is in sight, and fabricators, whose shops are scarcely operating to 50 per cent of capacity, look forward with interest to the action which will be taken at Washington on prices. A prediction of one seller of structural shapes is that a reduction of $5 or $10 a ton will be made, and if the cut is as much as $10, he says that some of the Eastern mills will not be able to operate, on account of high production costs. Most of the sellers favor a substantial reduction, one that will convince the builders and the railroads that the bottom has been reached. In no other way, it is explained, can an early revival of building activity be brought about. Less has been heard of price concessions on shapes than on other finished material, but on small angles a sale has been made in this district by a Pittsburgh mill at the bar base of 2.70c., without the usual extras. We quote plain material at 2.80c., Pittsburgh, or 3.045c., Philadelphia.

Bars.—Only a small amount of business is being done in bar iron at the prices recently established. The demand for steel bars is chiefly from jobbers. Concessions are being made on concrete reinforcing bars, a Pennsylvania mill having sold a single carload of twisted squares at 2.50c., Pittsburgh, which, including the 12½c. extra, means a cut of 32½c. per 100 lb. We quote common merchant bar iron at 3.145c.; refined bar iron at 3.895c., best refined bar iron at 4.145c. and soft steel bars, 2.945c., all Philadelphia.

Sheets.—The situation in sheets in this district is very quiet. We quote No. 10 blue annealed, 4.145c.; No. 28 black, 4.495c.; No. 28 galvanized, 6.295c., all Philadelphia.

Old Material.—A large Eastern steel company has purchased 10,000 tons of No. 1 heavy melting steel for early delivery to its works at $13.75 and $14, delivered, and it has come into the market for 20,000 tons more for delivery from April 1 to July 1. The market is sentimentally stronger, but steel is still available around $14. We note an offering of 10,000 tons at that figure. If the above-mentioned inquiry for 20,000 tons is closed, dealers predict that it will be at a price higher than $14. A leading dealer estimates that a $14 price for heavy melting steel is equivalent to a pre-war price of $10.75, taking into account the increased freight rates and higher labor costs. Although steel scrap is so much cheaper than pig iron, the steel companies have shown no marked buying interest, with the one exception above noted, as they have large stocks on hand. Some of the Eastern open-hearth plants are reported to be using up to 70 per cent scrap, this being true particularly at plants where no hot metal is put into the furnaces. We quote as follows for delivery at consumers' works, eastern Pennsylvania:

No. 1 heavy melting steel	$13.75 to $14.25
Steel rails, rerolling	16.00 to 17.00
No. 1 low phosphorus, heavy, 0.04 and under	20.00 to 21.00
Iron rails	20.00 to 22.00
Carwheels	23.00 to 24.00
No. 1 railroad wrought	20.00 to 21.00
No. 1 yard wrought	19.00 to 20.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	12.00 to 13.00
Bundled skeleton	12.00 to 13.00
No. 1 busheling	15.00 to 16.00
No. 2 busheling	13.00 to 14.00
Turnings (for blast furnace use)	9.50 to 10.50
Machine-shop turnings (for rolling mill use)	11.00 to 12.00
Cast borings (for blast furnace use)	9.50 to 10.50
Cast borings (clean)	13.50 to 14.00
No. 1 cast	21.00 to 22.00
Grate bars	18.00 to 20.00
Stove plate	18.00 to 20.00
Railroad malleable	18.00 to 20.00
Wrought iron and soft steel pipes and tubes (new specifications)	16.00 to 17.50
Ungraded pipe	13.00 to 14.00

Cleveland

CLEVELAND, March 11

Iron Ore.—Some additional curtailment of operations in the Lake Superior underground mines is being placed in effect because of the probability of a poor ore season, and one interest is planning to entirely shut down some of its properties. Many of the mines are not being operated at above about 50 per cent of maximum capacity. Shipments of ore from Lake Erie docks to the furnaces during February amounted to 910,948 gross tons, as compared with 555,852 tons during the corresponding month last year. If shipments are kept up at the same proportion to May 1 there will be less than 300,000 tons more ore on dock on that date than at the same time a year ago. The open weather that has prevailed is doubtless largely responsible for the heavy shipments during February. On May 1, 1918, the ore on docks amounted to 5,622,019 tons. We quote f.o.b., lower Lake docks, as follows:

Old range Bessemer, $6.65; old range non-Bessemer, $5.90; Mesaba Bessemer, $6.40; Mesaba non-Bessemer, $5.75.

Pig Iron.—A few car lot sales of foundry iron were made during the week, but no inquiry of any size came out and producers do not expect that there will be any demand except for small lots for immediate requirements until the plans now under way by the Government for the stabilizing of prices at lower levels are worked out and new prices are announced. Producers do not see how much reduction can be made unless there is a reduction in present operating costs. Requests for cancellations of contracts which have been coming out for the past two months appear to be about as numerous as ever, being largely for steel-making iron, and furnaces are receiving additional requests that shipments be held up. Not much resale iron is being offered, but this is attributed to the fact that there is practically no market for it. There is at present a surplus of silvery iron, and it is reported that some of this iron is now being placed in stock yards. The McKinney Steel Co., Cleveland, blew out its Scottdale furnace at Scottdale, Pa. this week. We quote delivered Cleveland, as follows:

Bessemer	$33.60
Basic	30.40
Northern No. 2 foundry	31.40
Southern No. 2 foundry, silicon, 2.25 to 2.75	37.25
Gray forge	30.40
Ohio silvery, 8 per cent silicon	46.90
Standard low phosphorus, Valley furnace	51.00

Coke.—Producers are having trouble in securing shipping orders from foundries, as most of the consumers of foundry coke have good-sized stocks and few are operating their plants at full capacity. There is practically no demand, although sales of small lots of Virginia foundry coke are reported at $6.50 to $6.75 per net ton. Standard makes of Connellsville foundry coke are held at $6.

Bolts, Nuts and Rivets.—Consumers of bolts and nuts are waiting for lower prices, and little business is being placed outside of pick-up orders. Some price shading is reported, but leading manufacturers are adhering to regular quotations and waiting for a reduction in steel prices. When new steel prices are announced bolt and nut manufacturers are expected to reduce their prices. The demand for rivets is light, but prices are apparently well maintained at the recent reduction. Some of the manufacturers are quoting small rivets at 60 per cent off the list as compared with the regular quotations of 50 and 10.

Old Material.—The firmer tone in the scrap market noted a week ago is still in evidence. This seems largely due to purchases by dealers to cover on short sales, as mills are buying practically nothing and some are holding back on shipments. Dealers are still buying scrap for yard stocks when material can be picked up at attractive prices. Prices no longer show a general downward trend. Heavy steel is slightly firmer, but a few grades including borings, busheling and malleable scrap are lower. Sales of heavy melting steel in small lots have been made to Ohio mills at $15. Dealers are able to buy turnings at $6.75 and drop

forge flashings at $8 and under. Sales of steel axle turnings are reported at $12.70 to $13. We quote delivered at consumers' yards in Cleveland and vicinity, per gross ton as follows:

Heavy melting steel	$14.50 to $15.00
Steel rails, under 3 ft	15.50 to 16.00
Steel rails, rerolling	13.50 to 14.00
Iron rails	23.00 to 24.00
Iron car axles	29.50 to 30.00
Steel car axles	27.00 to 27.50
Low phosphorus melting scrap	16.00 to 16.50
Cast borings	9.00 to 9.50
Iron and steel turnings and drillings	7.25 to 7.75
Compressed steel	10.50 to 11.50
No. 1 railroad wrought	17.50 to 18.50
Cast iron car wheels	15.50 to 16.00
Agricultural malleable	12.50 to 13.00
Railroad malleable	13.00 to 14.00
Steel axle turnings	12.50 to 13.00
Light bundled sheet scrap	8.50 to 9.50
No. 1 cast	20.00 to 21.00
No. 1 busheling	13.00 to 13.50
Drop forge flashings, 10 in. and under	13.00 to 13.50
Drop forge flashings, over 10 in.	8.50 to 9.50
Railroad grate bars	15.00 to 16.00
Stove plate	16.00 to 16.50

Alloy Steel.—The demand from the automobile trade has improved somewhat, but prices are irregular and show a downward tendency. Consumers are buying only in small lots for early requirements. Some have asked makers to guarantee prices, but the request has been refused. Open-hearth alloy steel bars are quoted as follows: Chrome vanadium, 6.75c. to 7c.; 3½ per cent nickel, 6.50c. to 6.75c.; chrome nickel, 1½ per cent nickel, 5.75c. to 6.25c.

Finished Iron and Steel.—Interest in the steel trade is centered in the price conference to be held in Washington next week. Orders have come out in better volume during the week, although there has been a falling off during the past day or two because of the possibility of lower prices. While the bulk of the business is coming directly or indirectly from the automobile trade, better demand has sprung up from some other classes of consumers. The demand is largely for steel bars. In structural lines an inquiry is pending for 900 tons of steel for a plant addition for the Wilson Foundry Co., Pontiac, Mich., and considerable other structural work is in the hands of architects. Plates are not active, although a new inquiry for 2000 tons has come out for oil tank work, and boiler shops are getting busier and are buying in small lots. Cleveland plate mills are adhering to regular prices, but find lower quotations in the New York territory presumably by an Eastern mill. Prices on hard steel reinforcing bars show a greater weakness and a quotation as low as 2.25c., Pittsburgh, has been made on small lots. An inquiry is pending for 200 tons for the new plant of the Cleveland Automobile Co. Some demand is coming from the implement trade for hard steel bars, which is bringing out a 2.50c. price. There is a fair inquiry for sheets but consumers are holding back orders waiting for lower prices. One mill has shaded black sheets $1 a ton and not only are strip mills seeking orders for blue annealed sheets in narrow widths at cut prices, but a quotation by a plate mill reported for No. 12 sheets on the plate base or $4 a ton under the blue annealed price for that gage. Jobbers quote:

Steel bars, 3.87c.; plates, 4.17c.; structural material, 4.07c.; No. 10 blue annealed sheets, 5.07c.; No. 28 black sheets, 6.12c.; No. 28 galvanized sheets, 7.47c.

Strip Steel Market Active at Youngstown

YOUNGSTOWN, OHIO, March 10.—Active business for both hot and cold-rolled strip steel marked the week. Individual orders were not for large tonnages, but the total was substantial. Automobile makers in the Detroit district are the principal buyers. Canneries are getting in the market for tin plate and are keeping the mills fairly busy, schedules averaging 80 per cent of normal. The Trumbull Steel Co. has 15 of 19 tin mills in commission, a marked improvement over operations earlier in the year.

Sheet buyers are still holding off, some plants running their sheet mill departments as low as 50 per cent. Delivery for this product may be had in from 10 to 15 days.

British Iron and Steel Market

Heavy Orders for Ships—Pig Iron Export Licenses Now Available—Coal Crisis

(*By mail*)

LONDON, ENGLAND, Feb. 17—The threatened strike of miners has further accentuated the difficulties of the position. The situation in steel is such that some makers decline to quote, although works are pretty well occupied with orders already on the books.

A favorable feature is the shipbuilding industry. The list of new and released ship building contracts, recently booked, is very satisfactory. These total considerably in excess of 100 vessels, representing a very large tonnage. One combination alone is stated to have ordered more than 50 steamers on the North East coast, while the Cunard is building 8 large liners, the British India Co. 9, the Union Castle Co. 2, Elders and Fyffe 4, Shaw, Savill and Albion 3, the Donaldson Anchor Line 6, and Donaldson Bros. 6, while other orders are also reported. Some of the yards have already two years' work on their books, and every building berth may be occupied for two or three years to come. In spite of this it is reported that Yarrow & Co. intend gradually to remove the center of their shipbuilding activities from the Clyde to Vancouver. This decision, it is understood, has been taken owing to the unsatisfactory conditions induced by the labor disturbances.

Some interest has been aroused owing to the reported embargo on imports of various articles into this country and it is known that a firm was recently refused permission to import some semi-finished steel on the ground that it was unnecessary. At the same time, the news seems to have been exaggerated in regard to such embargoes, imposed as a measure to safeguard home industries during reconstruction.

As to subsidies, it has just been stated in Parliament that the subsidy which had been paid to the iron and steel industry was about £48,500,000, of which £31,000,000 was represented by increased rates and insurance.

One of the most important features at present in the industrial situation is the crisis in the coal industry, where the demands made by the men for increased wages and reduced hours of work would, if agreed to, reflect seriously on nearly every industry. It has been calculated that the reduced working time would mean a reduction of about two-fifths of the output, or in round figures, a decline of about 100,000,000 tons. Meanwhile the enhanced wages, coupled with smaller production, would advance the cost of production to almost impossible levels. An additional demand of the miners is the nationalization of the coal-mining industry, and it appears that the government intends to proceed with an inquiry into the whole position, the outcome of which is uncertain. Although the miners asked for nationalization, there are said to be large and influential sections of them, particularly in South Wales, who are more in favor of trade union ownership and control than the idea of state ownership, while there is another section which approves of the guild socialist idea of state ownership and trade union control. In some quarters it is believed that the joint control by colliery companies and colliers and an equitable allocation of profits between labor, management, and capital, would be the best basis for the maintenance and development of coal mining. It seems to be conceded that the industry's present organization is such as to justify a thorough probing of the whole subject.

The issue of licenses for export of pig iron to neutral countries has been resumed. Unfortunately there is an acute shortage of foundry quality, so that there is very little available for export after the home demand has been met. This shortage is the dominating feature of the Cleveland market.

A good many industrial development schemes are at present in the air, several of which are in South Wales. Baldwins are about to erect blast furnaces, and are making rapid strides in specialized treatment of ore. There are also plans to develop the mineral resources of the Gower peninsula in the neighborhood of Swansea. Extensions are also being made at steel, tin-plate and spelter works.

New York

NEW YORK, March 11.

Pig Iron.—The week has been filled with rumors in regard to price cutting, but it is very difficult to establish definitely what has been done. The abandoning of the Pittsburgh basing system and the naming of $32.80, Pittsburgh, for No. 2 plain by at least one eastern Pennsylvania furnace, announced last week, has caused no excitement and it is conceded that other furnaces would do likewise if they were able to take any orders, but melters are not buying and are awaiting the outcome of the new co-operative movement. Considerable foreign business is still pending, but orders develop very slowly. We quote prices as follows, delivered New York, for Northern and Southern grades.

No. 1 foundry, silicon, 2.75 to 3.25	$35.80
No. 2 X, silicon, 2.25 to 2.75	34.00
No. 2 plain, silicon, 1.75 to 2.25	32.80
No. 2 X, Virginia, silicon, 2.25 to 2.75	36.65
No. 1 Southern, silicon, 2.75 to 3.25	41.70
No. 2 Southern (all rail), silicon, 2.25 to 2.75	39.95
No. 2 Southern (all rail), silicon, 1.75 to 2.25	38.70

Ferroalloys.—The market for domestic ferromanganese continues stagnant, with practically no business being done. There are occasional sales of carload lots for early delivery, most of which consist of resale material. These have been taken at about $150, although there is one producer who has sold 78 per cent alloy at $150 and now has a limited amount of 75 to 77 per cent alloy to dispose of. The situation could hardly be other than a waiting one on the part of consumers under present conditions. The blast furnace reports of THE IRON AGE show domestic production in February to have been 21,796 gross tons of ferromanganese, as compared with 21,331 in January, both of which are very much in excess of the expectations as to output early in the year. It was estimated that the February output would be less than 10,000 tons. There has been a little inquiry for export, on which $150 has been bid, but no sales are understood to have resulted. The spiegeleisen market is quoted at about $40, furnace, for 16 to 18 per cent alloy and $45 for the 18 to 22 per cent, with demand very light. One sale for export of a small quantity is noted. Domestic output thus far this year has decidedly declined until it reached 6309 tons in February, as compared with 11,456 tons in January and a considerably larger average per month in 1918. In the absence of permits to import British ferromanganese there are no quotations available on this product. The 50 per cent ferrosilicon market is as inactive as the manganese-iron alloy. The situation seems to be dominated by the resale material that is available, some of which has sold as low as $100 per ton. It is understood that one producer has offered ferrosilicon at $95, delivered.

Cast-Iron Pipe.—With the exception of the tonnage for New Jersey cities heretofore mentioned, there is no public business of consequence pending and none is in sight. The market is extremely dull. Prices for 6-in. and heavier are: $62.70, New York; for 4-in., $65.70; for 3-in., $72.70, and $1 additional for class A and gas pipe.

Finished Iron and Steel.—Selling offices, now that Government intervention in price stabilizing is proposed, seem to believe a price drop of over $5 per ton will be necessary to satisfy any dammed-up business, and they would not be surprised if a cut of $8 or $10 were the result. Meanwhile no business negotiation of any account is noted, save an unusually heavy tonnage of plates for an industrial company—which, of course, now waits on the naming of any new general level growing out of the deliberations of the trade with the Industrial Board, Department of Commerce. An interesting side light on the independence as to prices of the automobile demand is shown in the offer recently to pay a bonus for the delivery in two weeks of alloy steel bars. The Harris Structural Co. has taken the hangar contract, Hampton, Va., 1000 tons. Bids are asked by the Miami Copper Co., involving 250 tons, and by the New York Central on 250 tons of bridge work at West New York. Claims of plate quotations at 2.80c., Pittsburgh, are made, but the best that can now be done is apparently 2.90c. We quote mill shipments as follows: Steel bars, 2.97c.; shapes, 3.07c.; plates, 3.12c. to 3.27c.; common bar iron, 3.17c.; refined bar iron, from selected scrap, 3.92c., and best refined iron, 4.17c., all New York.

Warehouse Business.—Local warehouse business in shapes, more particularly structural material, is confined to slight repair work and alterations. The trade is only slightly active, warehouse business averaging about 50 per cent of what might be called normal. The whole effort of the warehousemen is to so regulate prices as to maintain the 1c. per lb. Government differential, which is regarded as approximately equivalent to the $10 to $12 per net ton generally added by jobbers before the war. It is considered that it is of first importance that this differential shall be maintained, as labor is now about 10 per cent higher than a year ago, and other factors have added to the overhead. One large jobber in high-grade semi-finished iron and steel specialties reports business the past month has been about 70 per cent of December total. On cold-drawn steel it has been holding to 9 points over list, and expects thus by doing less at a good profit to show no drop in earnings. This concern reports on the other hand that price cutting on these products in the Philadelphia district has forced the price down to net list, yielding little profit and creating a lot of dissatisfaction in the warehouse trade. It is generally felt that prices should be held where they are until the mills first cut their quotations. No quick pick-up in orders is anticipated because of the great accumulation of Government supplies now coming on the market and the release of additional heavy tonnages by the recent widespread cancellation of export orders. It is reported, for example, that over 1,000,000 lb. of 1 5/16-in. screw stock, which cost the Government about 5c. per lb., was sold not long ago to an Eastern interest, the highest bidder, for about 90c. per 100 lb. Out-of-store prices are as follows: Steel bars, 3.97c.; structural shapes, 4.07c.; plates, 4.27c.; No. 10 blue annealed sheets, 5.17c.; one-pass cold-rolled black sheets, No. 28 gage, 6.22c.; No. 28 galvanized sheets, 7.57c.; hoops, 4.57c.; bands, 3/16 in., Nos. 10 and 12, 4.57c.; shafting, plus 9 per cent of list.

Old Material.—Little change, if any, characterizes the market. One dealer stated that he sent offerings for sale of cast scrap at market prices to a long list of foundries in New England, New Jersey and nearby territory as a feeler without selling a ton. Comparatively little scrap seems to be accumulating in the yards of the dealers, the collectors finding present prices too low to yield them a profit. Optimism as to the future still prevails.

Heavy melting steel	$10.50 to $11.00
Rerolling rails	12.50 to 13.50
Relaying rails, nominal	47.00 to 50.00
Iron and steel car axles	19.00 to 21.00
No. 1 railroad wrought	16.50 to 17.50
Wrought-iron track	12.00 to 13.00
Forge fire	8.50 to 9.50
No. 1 yard wrought, long	14.50 to 15.00
Light iron	5.00 to 5.50
Cast borings (clean)	9.50 to 10.50
Machine shop turnings	7.00 to 8.00
Mixed borings and turnings	6.50 to 7.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	12.50 to 13.00
Stove plate	15.00 to 16.00
Locomotive grate bars	13.50 to 14.50
Malleable cast (railroad)	13.00 to 14.00
Old carwheels	21.00 to 21.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$22.50 to $23.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	21.00 to 22.00
No. 1 heavy cast, not cupola size	14.50 to 15.50
No. 2 cast radiators, cast boilers, etc.)	15.00 to 16.00

The Republic Iron & Steel Co. has banked No. 1 blast furnace in the Haselton, Ohio, battery. No. 2 stack is still down for relining.

Buffalo

BUFFALO, March 10.

Pig Iron.—The market remains inactive, the amount of business under negotiation being exceedingly small. Even export inquiry seems to be actuated by the assumption that negotiations between the heads of the iron producing interests and the representatives of the Government to stabilize the market may result in price concessions. Quite a number of furnacemen here do not incline to the belief that trade would be stimulated greatly by price concessions at the present time, being of the opinion that such a movement if started two months ago might have accomplished such a result, but that it is now too late, and that the price situation should be left to adjust itself. Furnaces are making fairly good shipments on existing contracts, although there have been some deferments and suspensions. In cases where they have already suspended shipments from 60 to 90 days, by request of consumers, the furnaces are now insisting that these consumers reciprocate by accepting some tonnage during March. The furnaces are giving all the easement possible to the consumer, but cannot find it possible to discontinue shipments entirely and indefinitely. The offering of 10,000 tons of Buffalo iron under the market price by an Eastern broker as mentioned in last week's issue, was re-sale iron. Producers here are not quoting under the schedule. There have been no changes in prices from last report. We quote as follows, f.o.b. Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$34.00
No. 2 X, 2.25 to 2.75, silicon	32.25
No. 2 plain foundry, 1.75 to 2.25, silicon	31.00
Gray forge	30.00
Malleable silicon not over 2.25	31.50
Basic	30.00
Basic, 1 to 1½ per cent mng	30.50
Basic, 1½ to 2½ per cent mng	31.00
Bessemer	32.20
Lake Superior charcoal, regular grades, f.o.b. Buffalo	38.50

Old Material.—Considerable improvement is noted in the status of the market, the attitude of consumers being more encouraging. Sales of heavy melting steel have been reported on a basis of $14 to $15. Other lines also show slightly firmer prices, there being a fairly good demand for turnings and borings, also for stove plate. No tonnages of more than moderate volume are being sold. There are no large tonnages of scrap in any line in dealers' yards in the district. Scrap dealers are awaiting with keen interest the outcome of the price stabilization plan on finished materials and pig iron which it is expected will be decided at the conference between the heads of producing interests and the Government officials this week, believing that it will increase buying of finished products, with a consequent benefit with respect to demand for scrap materials. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades	$14.00 to $15.00
Low phosphorus, 0.04 and under	19.00 to 20.00
No. 1 railroad wrought	18.00 to 19.00
No. 1 machinery cast	21.00 to 22.00
Iron axles	23.00 to 24.00
Steel axles	23.00 to 24.00
Carwheels	21.00 to 22.00
Railroad malleable	19.00 to 20.00
Machine shop turnings	7.00 to 8.00
Heavy axle turnings	13.00 to 14.00
Clean cast borings	10.00 to 11.00
Iron rails	21.00 to 22.00
Locomotive grate bars	16.00 to 17.00
Stove plate	17.00 to 18.00
Wrought pipe	13.00 to 14.00
No. 1 busheling	13.00 to 14.00
Bundled sheet stamping	11.00 to 12.00

Finished Iron and Steel.—There has been almost complete cessation of placement of orders, undoubtedly due to the widely published reports of the conference of steel manufacturers in New York last week, and the meeting of the authorized committee with the Government officials in Washington Wednesday of next week, with reference to prices. Orders are held in abeyance awaiting the outcome of this meeting.

It is known that a number of definite inquiries for wire rods, bars, structural material and plates are held over pending report of the results of the meeting; and it is felt that if confidence can be established, either by guaranty against decline, or by a definite announcement that the prices to be recommended will be effective for a stated period, that a considerable tonnage of all types of products will be placed.

St. Louis

ST. LOUIS, March 10.

Pig Iron.—Buyers, at least of large quantities, are still out of the market and although there are reports of a softening tendency on the part of furnaces no positive evidence has presented itself and no sales have been made corroborating the statements made. Some small lots continue to change hands to meet immediate needs, but that is about all. The feeling seems to be, however, that the real opening of spring will bring some improvement in buying. Government adjustments are proceeding slowly and this is delaying recovery somewhat.

Finished Products.—There is a slowly increasing interest in finished iron and steel, but no future contracts are being made. The buying movement evidenced is in car lot orders, which are making a fair aggregate considering the situation. Mill representatives are fairly well satisfied with the outlook and with the belief that there will be greater activity within the next 30 to 60 days. Warehouse stock movement is fair and we quote for stock out of warehouse as follows:

For stock out of warehouse, we quote as follows: Soft steel bars, 4.04c.; iron bars, 4.04c.; structural material, 4.14c.; tank plates, 4.24c.; No. 8 sheets, 5.09c.; No. 10 blue annealed sheets, 5.14c.; No. 28 black sheets, cold rolled, one pass, 6.19c.; No. 28 galvanized sheets, black sheet gage, 7.54c.

Old Material.—The improved feeling in the scrap market is being fairly well maintained, though there are no transactions of consequence. Dealers are continuing to lay down stock in their yards whenever they can pick up scrap at what they regard low prices. They generally evidence a feeling that the bottom has been about reached. Consumers are continuing careful inspection on existing contracts and are buying practically no additional supplies. They are still affected by the slowness of Government adjustments, but are hopeful of greater activity within the next 30 to 60 days. Some plants are shut down, others operating on a minimum basis, but taken as a whole the unemployment in this area is reported below that of other centers. We quote dealers' prices, f.o.b. customers' works, St. Louis district, as follows:

Per Gross Ton

Old iron rails	$22.00 to $23.00
Old steel rails, recolling	16.00 to 17.00
Old steel rails, less than 3 ft	16.50 to 17.00
Relaying rails, standard sections, subject to inspection	40.00 to 45.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	14.50 to 15.00
Heavy shoveling steel	14.00 to 14.50
Ordinary shoveling steel	13.00 to 13.50
Frogs, switches and guards, cut apart	14.50 to 15.00
Ordinary bundled sheets, scrap	9.00 to 9.50
Heavy axle and tire turnings	8.00 to 8.50

Per Net Ton

Iron angle bars	$14.00 to $17.50
Steel angle bars	15.00 to 15.50
Iron car axles	24.00 to 24.50
Steel car axles	23.00 to 23.50
Wrought arch bars and transoms	19.00 to 19.50
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.00 to 14.50
Railroad springs	15.50 to 16.00
Steel couplers and knuckles	15.50 to 16.00
Locomotive tires, 42 in. and over, smooth inside	13.00 to 13.50
No. 1 dealers' forge	11.50 to 12.00
Cast iron borings	8.00 to 8.50
No. 1 busheling	12.50 to 13.00
No. 1 boilers cut to sheets and rings	8.00 to 8.50
No. 1 railroad cast	16.50 to 17.00
Stove plate and light cast	12.00 to 12.50
Railroad malleable	12.00 to 12.50
Agricultural malleable	11.00 to 11.50
Pipes and flues	11.00 to 11.50
Heavy railroad sheet and tank	10.00 to 10.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	7.00 to 7.50
Country mixed	11.00 to 11.50
Uncut railroad mixed	12.00 to 12.50
Horseshoes	13.50 to 14.00

Cincinnati

CINCINNATI, March 11—(*By Wire*).

Pig Iron.—Last week's meeting in New York and the one scheduled in Washington for March 19 have tended to cut off practically all business and very few transactions have been made within the past few days. One medium-sized tonnage of Southern resale iron was sold to a Kentucky melter and it is understood that this went at a figure below the last Government price. This same firm is still in the market for an additional tonnage, but is hesitating about making any contracts for future delivery until something definite is known about what future prices will be. Reports of reductions in quotations in other districts have also had a retarding effect, and buying will undoubtedly be on a hand-to-mouth basis until something definite is known as to what future values will be. There is a fair tonnage of foundry iron in the hands of some consumers that would be disposed of below $31 furnace, if buyers could be found, but so far as is known furnace operators in the South and in the Hanging Rock district are maintaining the regular quotation. Practically all makers of Ohio silvery irons have quietly let out the word that they would take on business at $3 below the last Government quotations. Business in the silvery irons in small quantities is still very good, and as long as the wide differential between scrap and pig iron exists a considerable amount of high silicon iron will be taken by foundry melters. There is an absence of a demand for basic iron. It is understood that considerable malleable iron will be needed later on, but melters are not disposed to contract for it.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, No. 1 foundry and 1 soft	$35.85
Southern coke, No. 2 foundry and 2 soft	34.60
Southern coke, No. 3 foundry	34.10
Southern No. 4 foundry	33.85
Southern gray forge	33.60
Ohio silvery, 8 per cent silicon	49.30
Southern Ohio coke, No. 1	34.05
Southern Ohio coke, No. 2	32.80
Southern Ohio coke, No. 3	32.30
Southern Ohio malleable Bessemer	33.30
Basic, Northern	31.80
Standard Southern carwheel	51.60

Coke.—Oven operators in other districts have not yet followed the lead of Connellsville producers in making reductions on either furnace or foundry coke. This is probably accounted for by the indifference of consumers to contract for the future. A comparatively large tonnage of coke produced in the Wise County, Pocahontas and New River districts has already been sold for future shipment, but many consumers are yet uncovered. The foundries in this vicinity are well stocked, and many of them are holding back shipments on former contracts. The quality of coke in the Connellsville district is said to be improving. Market quotations there on 48-hr. coke range from $4 to $4.50 per net ton at oven and on foundry grades around $5.50 to $6. Wise County nominal prices are unchanged at $7.25 for furnace coke and from $8 to $8.25 for foundry coke. New River furnace and foundry coke remains around $8 for both grades.

Fluor Spar.—There has recently been some suspensions in shipments because consuming interests hurried forward shipments so fast some time ago that they are now well fixed. Very little new business is reported, although there are some purchases made of small lots. Washed gravel fluorspar ranges all the way from $25 to $30 per ton at point of shipment, with the first named figure representing nearby business.

Finished Material.—Warehouse business has declined some, although a considerable number of orders for bars, rods and small structural shapes are still coming in. There seems to be a tendency on the part of the large building contractors to await readjustment in prices before making any large purchases. There is so much building work held up that as soon as the public is convinced that prices are on an even keel the jobbers look for a rush in placing orders. Wire nails and barb wire are moving along at about the usual rate, and as retail merchants have small stocks the same condition may result as is predicted for the building trade. The mill price on No. 28 black sheets is unchanged at 4.70c. and galvanized 6.05c., Pittsburgh basis, with a freight rate of 23c per 100 lb. to Cincinnati.

The following are local jobbers' prices: Steel bars and small structural shapes, 4.13c. base; large rounds and squares 2 in. and over, 4.23c. base; plates, 4.48c. base; No. 16 blue annealed sheets, 5.48c.; steel bands, 3/16 in. and lighter, 4.98c. base (using the new band list). Reinforcing concrete bars, 4.25½c., and wire nails, $4.15 per keg base.

Nonferrous Metal Scrap.—Neither copper nor brass scrap is strong. Heavy copper is now quoted at 12½c., but crucible copper scrap is around 13½c. Heavy red brass is weak at 12½c., while light red brass is quoted at 7c. Heavy yellow brass is weak at 9½c. Block tin pipe has advanced a trifle and is now quoted at from 56c. to 58c. Lead is unchanged at 4½c. Business in all lines is dull.

Old Material.—Reports from other districts that the market is recovering are not borne out by conditions existing here. There is a fair demand for scrap, but the supply seems to be increasing. Dealers have had so much trouble in shipments that were refused on account of grading that they are somewhat careful in sending out material unless it is selected so that no complaints on this score can be made. The foundry melt of scrap is increasing, but not at a rapid rate. There is practically no demand for heavy melting steel, and any quotation on it here is a nominal one. The following are dealers' prices f.o.b. cars Cincinnati and southern Ohio in carload lots:

	Per Gross Ton	
Bundled sheet	$9.00 to	$9.50
Old iron rails	22.50 to	23.00
Relaying rails, 50 lb. and up	40.00 to	41.00
Rerolling steel rails	14.00 to	14.50
Heavy melting steel	12.00 to	12.50
Steel rails for melting	12.50 to	13.00
Old carwheels	15.00 to	15.50
No. 1 railroad wrought	13.00 to	13.50
	Per Net Ton	
Cast borings	$5.00 to	$5.50
Steel turnings	5.00 to	5.50
Railroad cast	15.50 to	16.00
No. 1 machinery	17.00 to	17.50
Burnt scrap	11.00 to	11.50
Iron axles	23.00 to	23.50
Locomotive tires (smooth inside)	14.00 to	14.50
Pipes and flues	10.50 to	11.00
Malleable cast	11.00 to	11.50
Railroad tank and sheet	9.00 to	9.50

Abandonment of Neville Island Plant Officially Announced

WASHINGTON, March 11—(*By Wire*).—Official announcement of the abandonment of the Neville Island ordnance project was made to-night by the War Department, confirming THE IRON AGE dispatch of two weeks ago. The buildings erected there, says the announcement, are to be torn down and the island restored to the original owners. The announcement denies the report that the plant is to become the principal ordnance storage depot for the Eastern United States. It will be used for storage purposes only temporarily to relieve congestion at other points.

All contracts with the United States Steel Corporation for construction work at Neville Island have been canceled. Tools and other equipment nearing completion will be finished and transferred to various Government arsenals as required by the peace-time program of the Ordnance Department.

Other tools suitable for commercial use may be placed on the market, but care is to be taken that this will not disturb market conditions unduly.

Cambria Employees Complain

WASHINGTON, March 11—(*By Wire*).—A delegation of employees of the Cambria Steel Co. appeared before Hugh L. Kerwin, director of conciliation of the Department of Labor, this afternoon, complaining that the corporation was discriminating against union labor at its Johnstown plant. They charged that several hundred men had been discharged. The department promised an investigation, although admitting it had no power to act.

IRON AND INDUSTRIAL STOCKS

Activity and Strength Increases as a Result of Business Co-operation

NEW YORK, March 10.

The market responded strongly the last of the week to several influences, which were interpreted as indicating a much stronger fundamental position of business than has been generally conceded, steel company shares generally showing several points advance over the Monday levels. The willingness of railroad bankers to meet the $750,000,000 railroad deficit, and of the steel interests to co-operate with the Secretary of Commerce as regards prices, both acted to buoy up values.

The range of prices in active iron and industrial stocks from Tuesday of last week to Tuesday of this week was as follows:

Allis-Chalms. com.	33½- 36¼	Lackawa. Steel..	66¾- 72¾
Allis-Chalms. pf..	88½- 90	Lake Supr. Corp.	19¼- 20⅝
Am. Can com....	46⅛- 49½	Lima Loco.	32 - 34
Am. Can pf.....102	-103	Midvale Steel ...	41⅝- 48
Am. Car & F. c..	90 - 93¾	Nat.-Acme	30½- 31¼
Am. Loco. com..	65 - 68⅞	Nat. En. & St. c..	51¼- 52¼
Am. Loco. pf....104¾	-105	Nat. En. & St. pf.....	99
Am. Radiator com.....285		N. Y. Air Brake.103	-108⅝
Am. Ship com...109	-111	Nova Scotia Steel.....	50
Am. Steel Fdries.	84½- 87¾	Pressed Steel c..	65½- 69¾
Bald. Loco. com.	77⅝- 89½	Ry. Steel Spg. c..	74¾- 78½
Beth. Steel com..	64⅞- 70⅞	Ry. Steel Spg. pf.....107	
Beth. Steel cl. B.	64¼- 71¼	Republic com. ..	75⅞- 85
Case (J. I.) pf..	93½- 93⅝	Republic pf. 101⅞	-102½
Central Fdry com.....	34	Sloss com.	48¾- 56⅞
Chic. Pneu. Tool.	64½- 66	Sloss pf.	85 - 88
Colo. Fuel	39 - 42½	Superior Steel ..	35½- 37
Crucible Steel c..	60⅞- 68¼	Transue-Williams	38½- 40
Crucible Steel pf.	94 - 95	Un. Alloy Steel..	40½- 43
Deere & Co. pf..	95 - 95¼	U. S. Pipe com..	18½- 20
Gen. Electric ...153⅝	-161	U. S. Pipe pf....	53 - 53¾
Gt. No. Ore Cert.	39 - 43⅛	U. S. Steel com..	91¾- 98
Gulf States Steel.	54 - 59	U. S. Steel pf...114⅛	-114⅞
Int. Har. com...116	-119¼	Westingh. Elec..	44 - 47⅛

Dividends

The Allis-Chalmers Mfg. Co., quarterly, 1¾ per cent on the preferred, and extra ¾ per cent on account of accumulated dividends, payable April 15.

The American Car & Foundry Co., quarterly, 2 per cent on the common and 1¾ per cent on the preferred, payable April 1.

The American Steel Foundries, quarterly, 2 per cent, payable March 31.

The Canadian Crocker-Wheeler Co., quarterly, 1¾ per cent on the common and preferred, payable April 1.

The Dominion Iron & Steel Co., Ltd., quarterly, 1¾ per cent on the preferred, payable April 1.

The Dominion Steel Corporation, Ltd., quarterly, 1½ per cent on the common, payable April 1.

Industrial Finances

Harold H. Herts, New York, has been appointed temporary receiver by the Supreme Court of the Berman Auto-Aero Radiator Co., Inc., 306 West Fifty-third Street.

A petition in bankruptcy has been filed against the Latshaw Steel & Metal Products Corporation, 261 Broadway, New York, with works at Spring City, Pa. Maurice L. Shane has been appointed receiver.

On a test suit brought by the Worth Brothers Co., Coatesville, Pa., to determine whether manufacturers of parts of steel shells, shipped to other companies for completion, were liable to the munition tax, Judge Thompson, United States Federal Court, Philadelphia, has issued a ruling holding that manufacturers of war munitions are subject to the special tax of 10 per cent on net profits from such munitions, whether the work is in preliminary stages or completed. The company contended that the rough steel forgings shipped from the plant were still articles available in common commerce and not subject to the tax.

Receiver Named for the Noble Electric Steel Co.

United States Judge Van Fleet yesterday appointed W. R. French receiver for the Noble Electric Steel Co., San Francisco, following an agreement between the creditors and directors of the firm. Mr. French formerly was vice-president of the company. The action followed the filing of a suit by the Penn Seaboard Steel Corporation of New York, which alleges that the Noble company is indebted to it in the sum of $80,387 and that there are other outstanding claims aggregating $350,000. The petition asserts that the standing of the Noble company, its good-will and valuable properties are such that, within a reasonable time, and in the hands of a receiver, it will be able to settle its indebtedness.

LaBelle Iron Works Report

The annual report of the LaBelle Iron Works, Steubenville, Ohio, for the year ending Dec. 31, was made public this week. The report shows net earnings for 1918, after making deductions of all kinds, of $7,715,679.01. Against this, the company sets aside $800,000 as provision for inventory reserve, adjustments, etc., and also sets aside $4,330,262.29 as provision for war profits, income taxes, state taxes, etc., leaving the surplus for the year as $2,585,416.72. In 1918 the company paid 8 per cent dividend on the preferred stock, or $793,232, and 12 per cent dividend on the common stock, or $1,809,848, a total of $1,983,080 in dividends, leaving a balance for 1918 of $602,336.72. Adding to this amount the surplus of $9,520,611.57 as of Jan. 1, 1918, gives a surplus carried to the balance sheet of $10,122,948.29.

The company produced in 1918, 505,391 gross tons of ore; 411,448 net tons of coal; 395,126 net tons of furnace coke; 13,883 net tons of domestic coke; 30,802 net tons of breese coke; 7,053 net tons of sulphate of ammonia; 5,057,640 gal. of tar; 1,083,937 gal. of benzol, 248,122 gal. of toluol. Last year the company made 13,708 net tons of beehive coke. Its output of pig iron in 1918 was 259,302 gross tons; steel ingots, 401,624 gross tons; billets and slabs, 325,809 gross tons; finished steel products, 354,516 gross tons. The aggregate shipments of all kinds in 1918 in value was $31,646,211.53, a decrease from the previous year of about $10,000.

Extension Plans of American Steel Foundries

A tentative plan of the American Steel Foundries provides for the issue of $25,000,000 of new preferred stock with which to purchase the Griffin Wheel Co., and possibly other properties, provided the majority of directors and stockholders favor the acquisition. The Griffin company has a capacity practically equal to that of the American Steel Foundries, and it is contended that the purchase would tend to stabilize Steel Foundries earnings. According to the annual report there were expended during 1918 for capital additions $670,747, consisting chiefly of extensions to the Alliance and Indiana Harbor Works. Substantially the entire product of the company's plants was for the Government; of its employees, 1147 from all departments, including the president and vice-president, entered Government service. The report states: "The tonnage now on our books would, under pre-war conditions, justify the hope of a satisfactory year. A large volume of repair and renewal business has been held back during the war which, if now released, would favorably affect our situation. If, however, the plan under which the railroads are to be operated is not soon and wisely determined, we can look for little buying from this source and a correspondingly quiet year Fortunately, your company is in excellent financial condition to meet such a contingency."

Union Twist Drill Co. Prospers

The Union Twist Drill Co., Athol, Mass., paid $24 in cash dividends on common stock in 1918, compared with $74 cash and 25 per cent stock in 1917, the reason for the difference being due to the general reserve set aside for taxes, amounting to $1,500,000, equal to the common stock issue. It earned $1,919,000 net before taxes in 1918, compared to $2,615,964 of the year before.

At a meeting of the Empire Steel & Iron Co., Catasauqua, Pa., at New York, Tuesday, Leonard Peckitt, president, and the other officers were re-elected. The board of directors was increased to 10 members and the nine members of the old board re-elected. The new member is J. S. Bache of J. S. Bache & Co., bankers, New York.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c., minimum carload 46,000 lb.; Denver, 99c., minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.80c.

Wire Products

Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $3.35 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.25; galvanized wire, $3.95; galvanized barb wire and fence staples, $4.35; painted barbed wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 58 per cent off list for carload lots, 57 per cent for 1000-rod lots, and 56 per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets	$4.20 base
Large boiler rivets	$4.50
7/16 in. x 6 in. smaller and shorter rivets	50-10 per cent off list
Machine bolts h.p. nuts, ¾ in. x 4 in.	
Smaller and shorter, rolled threads	50-10-5 per cent off list
Cut threads	50-5 per cent off list
Larger and longer sizes	40-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅝ in. x 4 in.:	
Smaller and shorter	40-10 per cent off list
Larger and longer	35-5 per cent off list
Carriage bolts, ⅜ x 6 in.:	
Smaller and shorter, rolled threads	50-5 per cent off list
Cut threads	40-10-5 per cent off list
Larger and longer sizes	40 per cent off list
Lag bolts	50-10 per cent off list
Plow bolts, Nos. 1, 2, 3	50 per cent off list
Hot pressed nuts, sq., blank	2.50c. per lb. off list
Hot pressed nuts, hex., blank	2.30c. per lb. off list
Hot pressed nuts, sq., tapped	2.30c. per lb. off list
Hot pressed nuts, hex., tapped	2.10c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank	2.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped	2.00c. per lb. off list
Semi-finished hex. nuts:	
⅝ in. and larger	60-10-10 per cent off list
9/16 in. and smaller	70-5 per cent off list
Stove bolts	70-10 per cent off list
Stove bolts	2½ per cent extra for bulk
Tire bolts	50-10-5 per cent off list

The above discounts are from present lists now in effect. All prices carry standard extras.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $57; chain rods, $65; screw, rivet and bolt rods and other rods of that character, $65. Prices on high carbon rods are irregular. They range from $70 to $80, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, per 100 lb., $3.70, in lots of 200 kegs of 200 lb. each, or more; track bolts, $4.90. Boat spikes, $5.05 per 100 lb., f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $14.50 per package; 8-lb. coating, I. C., $14.80; 12-lb. coating, I. C., $16.50; 15-lb. coating, I. C., $17.50; 20-lb. coating, I. C., $18.75; 25-lb. coating, I. C., $20.00; 30-lb. coating, I. C., $21.00; 35-lb. coating, I. C., $22.00; 40-lb. coating, I. C., $23.00 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.70c. from mill. Refined iron bars, 3.00c. common iron bars, 3.50c. in carload and larger lots, f.o.b. mill.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	47	20½	⅛ and ¼	26	+3
½	51	36½	⅜	27	List
¾ to 3	54	40½	½	31	13
			¾ to 1½	36	26

Lap Weld

2	47	34½	1¼	21	6
2½ to 6	50	37½	1½	28	14
7 to 12	47	33½	2	29	15
13 and 14	37½	..	2½ to 6	31	18
15	35	..	7 to 12	28	15

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	43	25½	⅛, ¼ and ⅜	25	8
½	48	35½	½	30	17
¾ to 1½	52	39½	¾ to 1½	36	21
2 to 3	53	40½			

Lap Weld, extra strong, plain ends

2	45	33½	1¼	22	7
2½ to 4	48	36½	1½	28	11
4½ to 6	47	35½	2	30	17
7 to 8	43	29½	2½ to 4	32	20
9 to 12	38	24½	4½ to 6	31	19
			7 to 8	23	11
			9 to 12	18	6

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	37	3½ to 4½ in.	12½
2½ to 3¼ in.	27	3 to 3¼ in.	+ 2
2¼ in.	20½	2½ to 2¾ in.	+ 4½
1¾ to 2 in.	16	2 to 2¼ in.	+19½
		1¾ to 1⅞ in.	+32

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$334	1¾ in.	$214
1¼ in.	274	2 to 2½ in.	184
1⅜ in.	264	2¾ to 3¾ in.	174
1½ in.	244	4 in.	194
		4½ to 5 in.	234

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

	Cents per lb.
Blue Annealed—Bessemer	
No. 8 and heavier	3.85
Nos. 9 and 10 (base)	3.90
Nos. 11 and 12	3.95
Nos. 13 and 14	4.00
Nos. 15 and 16	4.10
Box Annealed, One Pass Cold Rolled—Bessemer	
Nos. 17 to 21	4.50
Nos. 22 and 24	4.55
Nos. 25 and 26	4.60
No. 27	4.65
No. 28 (base)	4.70
No. 29	4.80
No. 30	4.90
Galvanized Black Sheet Gage—Bessemer	
Nos. 10 and 11	5.65
Nos. 12 and 14	5.15
Nos. 15 and 16	5.00
Nos. 17 to 21	5.45
Nos. 22 and 24	5.60
Nos. 25 and 26	5.75
No. 27	5.90
No. 28 (base)	6.05
No. 29	6.30
No. 30	6.55
Tin-Mill Black Plate—Bessemer	
Nos. 15 and 16	4.50
Nos. 17 to 21	4.55
Nos. 22 to 24	4.60
Nos. 25 and 27	4.65
No. 28 (base)	4.70
No. 29	4.75
No. 30	4.75
Nos. 30½ and 31	4.80

Metal Markets

Cents per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
	Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
March 7	15.50	14.75	72.50	5.25	5.00	6.60	6.25
" 8	15.50	14.75	72.50	5.25	5.00	6.55	6.20
" 10	15.25	14.50	72.50	5.25	5.00	6.55	6.20
" 11	15.25	14.50	....	5.25	5.00	6.50	6.15
" 12	15.75	15.00	72.50	5.25	5.00	6.50	6.15
" 13	15.75	15.00	72.50	5.25	5.00	6.50	6.15

NEW YORK, March 11.

The tone of the market has improved somewhat, but demand is not large. Copper reached new low levels in the last week, but has risen again slightly. The tin market is absolutely stagnant. The lead market is quiet but firm. Spelter is extremely quiet, and a little easier. Antimony is dull.

New York

Copper.—It is generally conceded that the copper market has taken a turn for the better, but opinion is divided as to whether this is a temporary improvement or not. Some feel that prices will again recede. One large producer reports that sales have been made each day this month, but not under 15c. per lb. for electrolytic. In the past week small quantities were sold as low as 14.50c. per lb., but mostly by small producers. We quote electrolytic copper at 15c. per lb., with the market firm and inquiry better than in some weeks. Lake copper is nominal at 15.75c., New York. It is understood that the War Department has ratified the tentative arrangement with the producers, mentioned last week, with regard to the sale of the Government stocks. Great Britain's stocks of copper as March 1 are announced as 51,379 gross tons as compared with 27,530 tons on Dec. 1, 1918.

Tin.—There was a movement in the last week to mark up the price of American tin, but it was apparently shortlived. While this was in progress there was a fair demand, but this has subsided. The market in its entirety is stagnant and at a standstill, being still under Government control. It is estimated that about 6000 tons of the original 10,000 tons of tin allocated to the United States Steel Products Co. has thus far been absorbed. Until the rest has been disposed of the market will remain in its present unsatisfactory condition. Opinion in the trade is that this will require another two months. There has been a little buying of future tin for shipment to London, to be held there until American import restrictions are removed. The total of such transactions have probably not been over 200 to 250 tons. Arrivals of tin have been 850 tons this far in March. The London market is higher at £245 per ton for spot Straits yesterday.

Lead.—The market is firm at 5.25c., New York, or 5c., St. Louis, which are the quotations of the leading interest. The outside market has eased slightly to 5.20c., New York. Buyers' wants have apparently been satisfied for the present so that the situation is quiet. British stocks of lead on March 1 are officially reported as 109,063 gross tons, as compared with 49,000 tons on Dec. 1, 1918.

Spelter.—The market has not improved in the last week. There is no demand from consumers and very little pressure to sell from producers. Prime Western for early delivery has receded to 6.15c., St. Louis, or 6.50c., New York, for early delivery. These levels are largely nominal as very little business has been done. Stocks of ordinary zinc in Great Britain on March 1 were 27,444 gross tons as against 18 768 tons Dec. 1.

Antimony.—Spot antimony, Asiatic brands, in wholesale lots, is quoted at 7c., New York, duty paid, with futures at about 6.75c. to 6.87½c., New York. Demand is light. It is understood that a small quantity of Cookson's antimony is offered at 13c., New York.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is quoted at 29c. to 31c. per lb., New York. Stocks in Great Britain on March 1 were 13,004 tons as compared with 10,215 tons Dec. 1, 1918.

Old Metals.—Prices have been lower this week, but there appears to be a little better feeling in the trade that the market may have reached bottom. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	15.50
Copper, heavy and wire	14.50
Copper, light and bottoms	12.25
Brass, heavy	11.25
Brass, light	7.50
Heavy machine composition	15.50
No. 1 yellow rod brass turnings	8.00
No. 1 red brass or composition turnings	12.00
Lead, heavy	4.75
Lead, tea	4.00
Zinc	5.25

St. Louis

MARCH 10.—Non-ferrous metals have been quiet the past week, with lead in carload lots closing at 5.25c.; spelter, 6.25c. In less than carload lots quotations are: Lead, 5.75c.; spelter, 7c.; tin, 72.50c.; copper, 18.50c. to 19c.; antimony, 8c. In the Joplin district zinc ore was about stationary and lead somewhat stiffer, with zinc blende selling at $42.50 base, except that bought for sheet zinc makers, which brought $45, basis 60 per cent metal. Demand was steady. Competition for lead ore brought the price up to $63 per ton, basis 80 per cent metal, a total advance since the rise began of $8. Calamine was steady at from $25 to $28, basis 40 per cent metal. The average for the week for the district was: Zinc blende, $42 per ton; calamine, $28; lead, $62. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 6.50c.; heavy yellow brass, 9c.; heavy red brass, 14c.; heavy copper and copper wire, 14c.; light copper, 12c.; pewter, 35c.; tinfoil, 40c.; lead, 4c.; tea lead, 3c.; zinc, 3c.

Chicago

CHICAGO, March 11.—A growing interest in copper has been manifested in the past day or two and the price is a little firmer. In tin there is a deadlock. Lead is firmly held, but quiet. Spelter is inactive. Antimony buying is fair. We quote copper at 16.50c. to 17c. for carloads; tin, 72.50c.; lead, 5.15c.; spelter, 6.25c. to 6.37½c.; antimony, 8.50c. to 9c. On old metals we quote copper wire, crucible shapes, 12.50c.; copper clips, 12c.; copper bottoms, 10.50c.; red brass, 12.50c.; yellow brass, 8c.; lead pipe, 3.50c.; zinc, 4c.; pewter, No. 1, 30c.; tinfoil, 35c., and block tin, 45c., all these being buying prices for less than carload lots.

F. A. Bennett and E. E. Seeley have formed a partnership under the firm name of Bennett & Seeley, with offices at 315 Court Exchange Building, Bridgeport, Conn., and will handle a complete line of foundry and electro platers' supplies. Mr. Seeley has followed this business locally for some 17 years, while Mr. Bennett is equally well known as the secretary of the Bridgeport Manufacturers' Association, and will continue actively to fill that office.

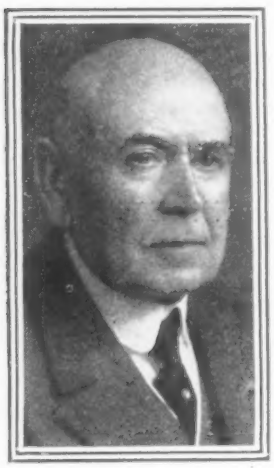
The Metallurgical Society of America, recently organized, will hold its first regular meeting at the Fort Pitt Hotel, Pittsburgh, Thursday evening, March 13. Dr. W. D. Ruder, research laboratory General Electric Co., is to present a paper on "The Mechanism of Failure in Steel."

The office of the American Foundrymen's Association has been moved to Room 1401, Harris Trust Building, Chicago. C. E. Hoyt is secretary-treasurer.

The Ontario Electric Steel Co., Inc., with its office at Fulton, N. Y., is the successor of the Fulton Steel Corporation.

PERSONAL

John Bindley, recently elected president of the Pittsburgh Steel Co., Pittsburgh, succeeding the late Wallace H. Rowe, was born in Pittsburgh 72 years ago and has always lived in that city, his larger interests always having been centered in the Pittsburgh district. Mr. Bindley began his business career in 1860 with John England, who was a file manufacturer, and also was engaged in the retail hardware trade. The business developed rapidly and was removed to larger quarters on Seventh Avenue, where it remained for many years, and was known as the Bindley Hardware Co., then one of the largest hardware houses in the country. The company went out of business in 1912. Starting in 1892, the Bindley Hardware Co. sold the products of the Pittsburgh Wire Co., Braddock, Pa., and some years after the company was taken over by the American Steel & Wire Co. This relation marked the beginning of Mr. Bindley's connection with the steel and wire business. He has been identified with the Pittsburgh Steel Co. since its inception in 1902, succeeding his brother, Edwin Bindley, as vice-president of the company in 1906. Mr. Bindley has also been active in the affairs of the Pittsburgh Steel Products Co., which operates mills at Monessen and Allenport, Pa., in the manufacture of seamless steel tubing. He is president of the Neely Nut & Bolt Co., of Pittsburgh, and is identified with other industrial interests of that city. Mr. Bindley was president of the National Hardware Jobbers' Association for some years.



JOHN BINDLEY

C. R. Miller, who has been assistant to C. O. Miniger, vice-president in production of the Willys-Overland Co., Toledo, has been made works manager of the Toledo plant of that company. Mr. Miniger recently became president and general manager of the Auto-Lite Co., Toledo.

Captain A. U. Wetherbee, who recently received his discharge from the Chemical Warfare Service and who was formerly chief engineer and assistant works manager of the Niagara Alkali Co., has accepted a position as chief mechanical engineer with the Powdered Coal Engineering & Equipment Co., Chicago.

Jack E. Shideler has resigned as purchasing agent for the Indianapolis plants of the Link-Belt Co., effective March 15, and will represent the LaSalle Steel Co., Chicago, in the Indiana territory, with headquarters at Indianapolis.

C. C. Wallace, formerly manager of the Loading of Munitions Section of the Stenotype Co., Indianapolis, is now director of development and service of the Powdered Coal Engineering & Equipment Co., Chicago.

C. H. Breaker has been appointed assistant sales manager for the Diamond Chain & Mfg. Co., Indianapolis, in charge of sales promotion.

F. P. Roth, Belmont Iron Works, Philadelphia, has been elected president of the Philadelphia Chapter of the American Association of Engineers. L. F. Boon, Philadelphia, is vice-president; M. F. Frick, Emergency Fleet Corporation, is recording secretary, and H. F. Kuzel, David Lupton Son's Co., corresponding secretary.

Charles B. Gilbert recently accepted a position with the Babcock Printing Press Mfg. Co., New London, Conn., as purchasing agent. He was graduated from Marquette University engineering department in 1913. He has had experience with the following concerns: Bucyrus Co., South Milwaukee, Wis.; Laurin & Leitch, contractors and engineers, Montreal, Que.; W. G. Cornell Co., contractor and engineer, in its Chicago office. In 1917 he enlisted in the Navy at Newport, R. I., receiving his appointment as ensign and entering the Third Officers' Training School at Annapolis. From there he was assigned to the submarine base, New London, Conn. He was honorably discharged from the service last December.

J. L. Perkins has resigned from the Japanese Paper Tissue Mills at Holyoke, Mass., to take a more active interest in the machine manufacturing plant of B. F. Perkins & Son.

Willard B. Jackson, who has been Boston district manager for William Jessop & Sons, Inc., for a number of years, has severed his connections and is now associated with Simonds Mfg. Co.'s steel mills, Lockport, N. Y. He has opened a New England office for Simonds' steel mills at 120 Milk Street, Boston.

Alfred S. Ayres has resigned his position with the Sanitary Co. of America, Linfield, Pa., as secretary and purchasing agent. As a result the following reorganization has taken place: B. W. Frederick of the Keystone Supply & Mfg. Co., Philadelphia, has accepted the position of secretary and will assist in the management of the business, handling sales and advertising; Grant P. Betchel, formerly in the accounting department, has been elected assistant treasurer; L. A. Shiffert has been elected assistant secretary and purchasing agent and is in charge of buying and manufacturing.

Prof. A. E. Kennelly, director of the Department of Electrical Engineering, Harvard University, Boston, addressed the local members of the Worcester (Mass.) Section of the American Society of Mechanical Engineers on "Field Ordnance and Field Ordnance Appliances," on March 6. Professor Kennelly was for five months in France at the front making a study of ordnance and of the microphone and other devices to locate Hun heavy artillery.

Edward A. Summer, Detroit, has been elected director of the American Radiator Co., Chicago, to fill the unexpired term of the late Charles Stinchfield, Detroit.

A. M. McCutcheon, chief engineer Reliance Electric & Engineering Co., Cleveland, has resumed his work with that company, having received his honorable discharge from the Navy, where he served as lieutenant on the battleship Louisiana.

J. T. Plummer, who has been connected with the Haynes Stellite Co., Kokomo, Ind., as district manager for two and a half years at Cleveland, and at Kokomo, Ind., with the executive offices, has resigned to open sales offices in Chicago for "Perfect" pulley coverings.

Amel R. Carlson has finished his Government service on the purchasing staff of the Wright-Martin Aircraft Corporation, New Brunswick, N. J., and returned to the Commonwealth Motors Co., Chicago, in the capacity of assistant general manager.

Prof. M. E. Cooley, dean of the College of Engineering, University of Michigan, and president American Society of Mechanical Engineers, will address the members of the Connecticut Section, A. S. M. E., March 21, at the Mason Laboratory, Yale University, New Haven, Conn.

R. E. Clingan, formerly with the Hess-Bright Co., has been appointed sales manager of the Bock Bearing division of the Standard Parts Co., Cleveland, and will have his headquarters at the Bock Bearing plant in Toledo. W. B. Fewell, formerly associated with the General Motors Corporation, has been appointed sales manager of the axle division of the Standard Parts Co., with headquarters in Cleveland.

Walter P. Hatch, for nine years in charge of the wire sales division in the home office of the Morgan Spring Co., Worcester, Mass., has been appointed district sales manager for the western district, making his headquarters at Chicago, effective last week. Mr. Hatch was the recipient of a very handsome loving cup, suitably inscribed, from his associates and the company.

John H. Adams has severed his connection as general manager of the Birmingham Trussville Iron Co., and has opened offices in the American Trust Building, Birmingham, as consulting mining engineer.

Frank C. Thompson has been appointed purchasing agent of the Link-Belt Co. at its Indianapolis plants. Mr. Thompson was formerly general storekeeper of the Indianapolis and Chicago plants.

H. L. Beyer, director of purchases Hale & Kilburn Corporation, Philadelphia, has been elected secretary. He will continue in charge of purchases.

G. William Crispell has been appointed production superintendent of the Electric Service Supplies Co. in its plant at Philadelphia. Mr. Crispell received his early training with the General Electric Co. on installation and maintenance work. He became laboratory assistant to the late Prof. James F. McElroy, consulting engineer with the Consolidated Car Heating Co., on both electric and steam railway specialties, and for several years was in charge of the electrical manufacturing of this company. More recently Mr. Crispell was assistant superintendent of the Westinghouse Electric Products Co. at Mansfield, Ohio.

J. F. Mackin, located in Columbus, Ohio, has recently become connected with the Black & Decker Mfg. Co., representing it throughout the State of Ohio. Mr. Mackin has been affiliated with the portable electric drill industry for years, and was at one time with the Independent Pneumatic Tool Co.

Alexander B. Richards, New York sales agent Reading Iron Co., Reading, Pa., retired March 1 after a continuous service of 30 years in selling Reading wrought iron pipe, boiler tubes and bar iron. He is succeeded by Thomas Barclay, who has been associated with Mr. Richards for 30 years. H. S. Carland will be his assistant.

Charles Schenck has been appointed production engineer at the plant of the Bethlehem Steel Co., Bethlehem, Pa., succeeding H. S. Vance, resigned.

C. K. Cairns, a well-known machine tool man of Cincinnati, has been appointed sales manager of the Monarch Machine Tool Co., Sidney, Ohio.

Lieutenant Erwin P. Stupp, son of Peter Stupp, vice-president Stupp Brothers Bridge & Iron Co., St. Louis, has returned from France, where he had been since last July as a member of the 306th Engineers of the Eighty-first Division.

Paul Driscoll, assistant to the district sales manager, Lackawanna Steel Co., in Philadelphia, has been appointed New York district sales manager of the Tacony Steel Co., Philadelphia, maker of forgings and special steel. He will assume his new duties April 1.

F. Chassaing, 55 Rue de Soissons, Bordeaux, France, who before enlisting in the army had traveled for a number of years selling iron, steel, hardware and machinery, has been honorably discharged from the French Army and is anxious to establish relations as a representative of American firms to act in the region of Bordeaux and the southwest of France.

Lieutenant Stephen Avery, Webster Groves, Mo., who before enlisting in the air service was assistant advertising manager of the Hyatt Roller Bearing Axle Co. at Detroit, has just returned home. He has been officially credited with downing two German planes as a flyer in the second pursuit group of the Thirteenth Aero Squadron.

W. S. Pilling of Pilling & Crane, pig iron merchants, Philadelphia, has gone to California for a month's rest.

H. Lowe Mentser, formerly manager of the Far Eastern department, Vulcan Steel Products Co., having severed his connection with that firm, is now associated with the Parker Co. in the iron and steel department. Prior to his entering the export field he was identified with the Midvale Steel & Ordnance Co.

H. D. Gates, advertising manager, Pangborn Corporation, Hagerstown, Md., will address the Newark Foundrymen's Association, April 2, on "The Sand Blast in the Foundry."

James Farrell has resigned as assistant to the head of the industrial relations department, Bethlehem Steel Corporation, to accept a position as head of the industrial relations department of the Worthington Pump & Machinery Corporation.

H. A. Christmann has been appointed purchasing agent of the Monitor Stove Co., Cincinnati.

A. B. Sonneborn, sales engineer, who during the war was instructor in the radio school at Penn Field, Tex., has been honorably discharged and has resumed his position as representative in Detroit for the Federal Machine & Welder Co., Warren, Ohio. Mr. Sonneborn's offices are at 1516 Ford Building.

A. A. Gloetzner, who for the last two years served as chief engineer and manager of sales of the Covert Gear Co., Inc., Detroit, has been elected vice-president of the company, an office he will hold in connection with his other duties. P. A. Clum was re-elected president and treasurer of the company, and F. E. Mosher secretary and general manager.

James Hartness, past president American Society of Mechanical Engineers, delivered the second of the series of J. E. Aldred lectures in the Mechanical Building, Johns Hopkins University, Baltimore, last week. His subject was "The Human Element in the Machine Shop."

Herbert DuPuy, chairman Crucible Steel Co. of America, Pittsburgh, has gone to Florida and will return to Pittsburgh about April 15.

E. L. Parker, president of Columbia Steel & Shafting Co., Pittsburgh, has gone to Atlantic City to recuperate from a recent operation of appendicitis.

Charles H. Foster, formerly secretary and treasurer of Superior Steel Corporation of Pittsburgh, has been appointed vice-president and treasurer of the company, succeeding Capt. H. Devens, who retired some time ago and is now in Florida. H. D. Sarge has been appointed secretary and assistant treasurer. Mr. Sarge for some years was chief accountant of the American Iron & Steel Mfg. Co., Lebanon, Pa.

C. W. Johnson has been appointed manager of works of the Westinghouse Electric Mfg. Co., East Pittsburgh. After graduating from Ohio State University Mr. Johnson entered the employ of the Steel Motor Co., Johnstown, Pa. A year later he became associated with the Bullock Electric Co., Cincinnati, and in 1904 he was made superintendent of Allis-Chalmers-Bullock, Ltd., Montreal, Canada. In 1907 he entered the employ of the Westinghouse Co. as chief inspector of works, later being promoted to general superintendent, in which capacity he has served until his recent appointment.

W. Stewart Horner, president National Association of Sheet & Tin Plate Manufacturers, Pittsburgh, is in Florida for an extended visit.

J. Ramsay Speer, president Pittsburgh Iron & Steel Mfg. Co., Pittsburgh, who has been in Florida for some time, will return about April 1.

W. G. Costin, president Pittsburgh Screw & Bolt Co., Pittsburgh, is in Florida for an extended stay.

C. W. Whitney has severed his connections with the Yuba Mfg. Co. and has opened an office as exporter and manufacturers' agent in the Insurance Building, San Francisco. He has been appointed by the Bucyrus Co. of South Milwaukee, Wis., to represent it on the Pacific Coast for domestic and foreign business in connection with gold dredges. Mr. Whitney also expects to handle several other lines of machinery and mechanical goods, and has established foreign connections in South America, Philippines and other parts of the Far East.

Edward W. Dodge, formerly associated as sales manager with the Norton Co., Worcester, Mass., and Waltham Grinding Wheel Co., Waltham, has been appointed general sales manager for the Star Corundum Wheel Co., Detroit, with offices in that city.

Wilbur S. Wilding has been appointed manager of sales for the Roberts Filter Mfg. Co., Philadelphia. He was formerly in charge of the New York office.

Walter A. Zelnicker, president Walter A. Zelnicker Supply Co. and affiliated companies in St. Louis, has appointed Cline B. Finnell his private secretary. Mr. Finnell, who recently returned from the Officers' Training School at Camp Pike, Ark., was formerly traveling secretary to the general superintendent of the C., B. & Q. Railroad, and later private secretary to Clarence H. Howard, president Commonwealth Steel Co.

Officers of the Mahoning Valley Employers' Association, elected recently at the annual meeting, are: Herbert E. Herrod, president; W. H. Foster, first vice-president; William J. Wallis, second vice-president, and Harry A. Boyd, treasurer. Mr. Herrod continues as secretary.

John Bowdich and P. M. Lowerse have been named branch managers of the Truscon Steel Co., Youngstown, Ohio, in Chicago, and will have charge of sales in Illinois, Iowa and northwestern Indiana. They will also have supervision over the large stock warehouse of the company in Chicago, operating under the name of Bowdich & Lowerse.

C. B. Carter of the American Brake Shoe & Foundry Co. has joined the selling force of David Evans & Co., McCormick Building, Chicago, makers of pig iron and steel castings. Mr. Carter recently returned from France, where he had the rank of captain with the 314th Mobile Ordnance Repair Shop attached to the Eighty-ninth Division.

John B. Canfield has become associated with the Harley Co., Springfield, Mass., as special representative and counsel. Mr. Canfield began work in mechanical lines in 1885 with the Boston & Albany Railroad at Boston as machinist apprentice. He rose to be master mechanic of the Albany and Boston divisions, but severed his connection with the road in 1916, after a continuous service of 30 years. He studied law at night in Boston and was admitted to the bar in Massachusetts in 1910. At the time of his connection with the Harley Co. he was actively engaged in the practice of law in Springfield. He served during the war as a major of engineers. He was honorably discharged in January.

Robert A. McDonald, formerly superintendent of the Crescent works, Crucible Steel Co. of America, has been appointed general superintendent of the Pittsburgh Crucible Steel Co., Midland, Pa., relieving John W. Dougherty, the president, of a part of his duties. Mr. Dougherty will give most of his time to supervision of the construction of a new blast furnace and by-product coke plant at Midland now under way.

Frederick W. Krebs, recently with the aircraft production board, is again affiliated with the United Alloy Steel Corporation. He is now in charge of the company's Cleveland sales office, 614 Swetland Building.

The Industrial Board of the Department of Commerce, Washington, has elected T. B. Reed, vice-president of the United States Silica Co., Chicago, its secretary.

T. C. Ham, formerly assistant to George A. Mason, manager of sales of the wire department of the Jones & Laughlin Steel Co., Pittsburgh, has been transferred to the export department of the company at 165 Broadway.

Georges Charpy, largely no doubt in recognition of his notable contributions to metallurgy, was elected Dec. 23, 1918, a member of the French Academy of Sciences, in the division of the sciences applied to industry.

Notice has been filed in the State Department at Harrisburg, Pa., of the merger of the Pittsburgh Forge & Iron Co. and the Pittsburgh Rolling Mill & Forge Co., to be known as the Pittsburgh Forge & Iron Co., of Pittsburgh. The capital of the new company is to be $305,000. F. E. Richardson, Sewickly, Pa., is president; Benjamin G. Welle, Bryn Mawr, Pa., vice-president, and W. I. Miller, Crafton, Pa., secretary-treasurer.

OBITUARY

PHILIP SIDNEY DYER, president and treasurer American Horse Shoe Co., Phillipsburg, N. J., died at his home in New York, March 10, following an operation performed a week before. With Charles Holton he organized the American Horse Shoe Co. in 1892. He was also vice-president of the Sweet Steel Co., vice-president West Branch Steel Co., a director of the Canadian Shovel & Tool Co. and a director of the Duryea Mfg. Co. Mr. Dyer was also a member of the Engineers' Club and of the American Iron and Steel Institute. His wife was daughter of the late Charles W. Miller, head of the Phoenix Horse Shoe Co. Mr. Dyer was 62 years old.

WELLINGTON R. BURT, one of the owners of the Ann Arbor Railroad, heavy stockholder in the Michigan Central Railroad and iron mine operator at Hibbing, Minn., died Sunday, March 2, at his late home in Saginaw, Mich., at the age of 88. Mr. Burt controlled vast timber holdings in the Upper Peninsula of Michigan and in St. Louis county of Minnesota. After the timber was removed from these tracts, it was discovered that under them lay great deposits of iron ore for the mining for which he contracted with the United States Steel Corporation on a royalty basis.

WILLIAM DALE RUDY, consulting analyst in iron and steel manufacture, died of bronchitis following influenza Feb. 16. He was born in Columbus, Ohio, in 1881, and was graduated from the Hill School, Pottstown, Pa. He was connected with furnace plants in the East, South and Middle West until he went to Philadelphia about 13 years ago to open a consulting analytical laboratory. Mr. Rudy was a member of the Engineers' Club of Philadelphia and of the K-Koal Society.

JAMES L. ORR, president Orr Iron Co., Evansville, Ind., and father of S. L. Orr, second vice-president American Iron, Steel and Heavy Hardware Association, died recently of heart failure, aged 80 years. He retired from active business about 10 years ago. He was named after James Laughlin, who with his brother Alexander were silent partners with his father, Samuel Orr, in the organization of the Orr Iron Co. in 1835.

GEORGE K. GARVIN, president Garvin Machine Co., machine tool builder, 139 Varick Street, New York, died at his home in Garden City, Long Island, Feb. 20. He was born in Hartford, Conn., in 1859. He was the inventor of a large number of improvements in machine tools. His affiliations included the Engineers' Club of New York, the American Society of Mechanical Engineers and the Garden City Club.

HARRY L. FROST, president Frost Steel & Wire Co., Ltd., with plants at Welland and Hamilton, Ont., Can., and president Frost Superior Fence Co., Cleveland, died in New York March 7 of pneumonia. He was born in Danville, Ohio, 44 years ago, moving to Canada in early life.

FREDERICK HOBART, mining engineer and formerly associate editor of *The Engineering and Mining Journal*, died, March 8, at his home in Flushing, Long Island, at the age of 76. He was a graduate of College of the City of New York and served in the Civil War, retiring as captain.

RICHARD M. BEAR, Columbus, Ohio, president Franklin Die & Tool Co., died at a hospital in that city, Feb. 28, after a brief illness, aged 34 years.

WILLIAM I. HALL, purchasing agent the Cincinnati Bickford Tool Co., Cincinnati, died at his home in that city, March 6, after a brief illness from influenza. He had been with the company 15 years and was highly esteemed by its officials.

JAMES M. POYNER, electrical engineer, for 10 years with the Baltimore office of the General Electric Co., died of influenza, aged 37, at Charleston, W. Va., March 3. He went to Baltimore from the Lynn Works of the General Electric Co., and remained there until Jan. 15 last, when he resigned to take up new work in Charleston.

CASTINGS AND FORGINGS

War Department Asks Advice as to Disposal of Large Tonnage on Hand

WASHINGTON, March 11.—The War Department has asked the advice of the directors of the American Iron and Steel Institute on the question of disposing of about 150,000 gross tons of steel castings and forgings, in various stages of completion, which have been listed as "surplus material" by the Ordnance Department. The Institute has appointed a committee to consider the matter. This committee consists of J. A. Farrell, E. G. Grace, J. A. Topping, E. A. S. Clarke and A. C. Dinkey.

The Director of Sales of the War Department has sent to the committee a statement of the surplus steel on hand, and will await the committee suggestions. The total is said to be surprisingly low and to be far less than had originally been expected to result from the adjustment of the department's claims.

The work of completing inventories of surplus properties still lags, largely because the adjustment of contracts is still far behind the original schedule. Claims are, however, coming in more rapidly now. Doubt as to the future size of the Army also has an important bearing on this question because the amount of the surplus in many branches will always depend upon the size of the reserves which must be carried.

The office of the Director of Sales has been continuing the sale of much of the property. So far, about $50,000,000 of various items has been disposed of at prices netting almost 90 per cent of the original cost to the Government. In all lines, it is reported, the final inventories have been far behind the original lists. This also has simplified the problem. Some of the divisions have almost wiped out their surplus. The Division of Construction, which began with an inventory of about $26,000,000 worth of surplus at the beginning of the year, has less than $10,000,000 left. More than half of the difference disappeared when the revised inventories were made up. The remainder was absorbed by other branches of the service or sold.

The War Department's Motor Trucks

Regarding the probable disposition of the motor trucks now owned by the Government, concerning which misapprehension in several quarters has been felt over the possible ill effect on the domestic market from the War Department's offering them for sale, the following resumé has been made by Arthur T. Murray, president Bethlehem Motors Corporation, Allentown, Pa., from reliable sources. Trucks delivered overseas have amounted to approximately 42,310. The assistant Secretary of War advised the War Industries Board under date of Dec. 20, 1918, that it was not desired to return any of the motor truck equipment now overseas. The total delivered and still in this country, plus delivery authorized on outstanding contracts, will approximate 52,000. Under the provisions of the act of July 2, 1918, the Post Office Department has requested that the War Department deliver to it about 17,000 trucks. This leaves 35,000 now in use, or available shortly for the services of the War Department. This department has requested Congress to authorize a standing army of 20 divisions plus four base divisions, which will require a unit transport equipment of about 112,000 vehicles, plus reserves now figured at 100 per cent on a war basis.

Action Against Saddlery Association

WASHINGTON, March 11.—Although it deals entirely with an unrelated industry, the iron and steel trade is vitally interested in the sweeping action which the Federal Trade Commission has taken to brand as a "conspiracy in restraint of open and free competition" the membership of the Wholesale Saddlery Association and the National Harness Manufacturers' Association. The order of the commission establishes a precedent for the possibility of similar action against organizations of jobbers and dealers in other lines. It names the 178 officers and members of the Wholesale Saddlery Association and the 20 associated retail harness organizations of the National Harness Manufacturers' Association of the United States and directs them "forever to cease and desist" from the practices by which it charges they have violated the law. The commission declares that it has found that monopolistic practices and policies had worked to the exclusion of competitor jobbers, dealers and mail order houses not recognized by the two organizations as "legitimate" dealers; and had operated to restrict the free and unhampered sale and distribution of harness, saddlery and accessories throughout the United States.

Metal Trades Convention April 21-24

The National Metal Trades Association, through Secretary H. D. Sayre, announces the program for its convention to be held at the Hotel Astor, New York, April 21, 22, 23 and 24. On Monday, April 21, there will be an executive committee meeting at 10 a. m. and a secretaries' dinner at 7 p. m. On Tuesday a meeting of the administrative council will be held from 10 a. m. to 5 p. m. A meeting of local branch secretaries will be held the same day and the alumni dinner will take place at 6:45 p. m. The convention will open Wednesday morning at 10 o'clock. A buffet luncheon will be served at noon and the session will continue throughout the afternoon. The annual banquet will be held Wednesday evening. Another session of the convention will take place on Thursday, after which will be a meeting of the incoming administrative council.

Cincinnati Metal Trades

The Cincinnati Branch, National Metal Trades Association, held its annual meeting and banquet at the Cincinnati Business Men's Club on the evening of March 6. The following officers were re-elected to serve during the ensuing year: President, J. B. Doan; vice-president, W. T. Emmes; treasurer, H. W. Kreutzberg; secretary, J. Wallace Carrel and business secretary, J. M. Manley. The executive committee is made up of R. T. Hazelton, Neil C. Lamont and Henry Ritter.

The speakers were James Schermerhorn, editor, the Detroit, *Times;* W. Caldwell, Chicago, and Major Bert L. Baldwin of Cincinnati. All of them were unanimous in expressing the opinion that a period of prosperity is ahead of the country, but that closer co-operation is needed among all classes in hastening this period.

National Federation of Construction Industries

The initial number of the *News Letter*, published by the National Federation of Construction Industries, shows the committees of that organization as far as appointed, with an outline of some of the work done and in hand. Several committees are in active operation, while others are being appointed as necessity requires. Copies of the *News Letter* will be sent on application to the National Federation of Construction Industries, 757 Drexel Building, Philadelphia.

The Catani Electric Furnace

The Catani firm of Rome, Italy, began working in 1915 with a single Catani electrical furnace of 100 kw. Another of 500 kw. started work in November, 1917. In this furnace the electrodes are suspended at their upper end, and good contacts are effected on their sides by bars of copper of large section, between which the carbons move vertically. The copper bars are hollow and are cooled inside by the circulation of cold water.

Further curtailment in the working hours of the Steelton, Pa., plant of the Bethlehem Steel Co. became effective March 3, affecting 500 employees. The general reduction is from 12 to 8 hours daily, although some employees are still working longer than 8 hours and some were working less than 12 before the reduction. The change affected the rolling mills chiefly. All but the 28-in. mill are now operating on three 8-hr. shifts instead of two 12-hr. shifts. Coke ovens, open-hearth and blast furnaces are operating unchanged.

Steel Manufacturers Agree to Co-operate

(*Continued from page* 701)

tractively the "flood of buying" which is to follow a "stabilized market." The statement put it this way, under the heading of "Results to Be Achieved:"

"(a) Basic commodities such as steel, building materials, textiles, and food will be considered first and brought to a stable basis. The governmental policy, as expressed by the bill to authorize purchase by the Government of wheat at the guaranteed price and resale of it at the world price, is to assist in bringing prices of basic commodities to normality by bringing down the cost of living. It is hoped that these steps alone will automatically operate to reduce the price of fabricated articles. If they do not do so in any particular case, the industry affected will be invited into conference.

"(b) As soon as a stable and wholesome scale of prices is achieved, the cost of living will have so far been reduced as to create automatically reductions in the price of labor without interfering with American standards and ideals for the treatment and living conditions of labor, and thus the last inflating element will have been withdrawn from prices. It is believed that industry will agree that the cost of living must be substantially reduced before labor should be asked to accept lower wages and thus industry should stand the first shock of readjustment.

"(c) The assurance to the country of a market stabilized at the lowest reasonably expected level will loosen such a flood of buying for the recreation of stocks, the making up of arrears in the building program, the feeding of needs long starved by economy and the invasion of world markets, as may stand unprecedented in this country. From the stable level thus reached by co-operation we may expect a healthy and normal condition created by the complete and unhampered operation of the law of supply and demand."

Questions and Answers

The statement then indulges in a "question and answer" catechism in reply to some of the objections that have been made:

"Objection (a) Business resents governmental interference and control which is to be avoided rather than encouraged. Let conditions alone and the law of supply and demand will cure all evils.

"Answer: The war developed a new thing in government—co-operation and mutual help between government and industry in which government appeared not as a policeman and not as a jealous guardian of a suspicious character, but as a friend and helper. This idea proved itself. What is proposed is not government control. The board has no power of control. It is proposed to provide a forum in which industry can meet and agree on a policy for itself at the instance and with the approval of government, which will help the law of supply and demand over the gap between hold-over war prices and a stable level.

"Objection (b) Business and industry will not come into a governmental conference unless there is a power of compulsion.

"Answer: The experience of the W. I. B. utterly disproves this criticism. It has been argued that patriotism impelled business and industry to the W. I. B. Patriotism is not adjourned with the closing of the war.

"Objection (c) War prices were fixed at such a level as to insure the production of many high-cost and inefficient producers. What is proposed would shut off this production.

"Answer: This production is not needed in peace. The American people cannot be expected to support inefficiency in the enterprises that serve them with the necessaries of life or to maintain production not normally needed. Inflated production above that which would be supported by the law of supply and demand must cease.

Readjustment of Labor

"Objection (d) Such readjustment must necessarily require redistribution and readjustment of labor.

"Answer. This is quite true. It is necessary. The distribution and allocation of labor to war industries has upset the normal pattern in this country for four years. What is proposed is a stimulated peace industry which will employ as much or more labor as did war industries, especially considering the loss of man-power, due to decreased immigration, loss by influenza, war and probably increased Army and Navy. That it will employ them in different places and at different tasks is inevitable, whether the proposed step is taken or not.

"Objection (e) A general reduction in selling prices now will force industry and commerce to take a loss on products purchased at war prices.

"Answer: This is true and inevitable, whether the proposed plan is attempted or not, but under the proposed plan better adjustments are possible: buying will begin immediately, the overhead of continuing high cost operations through a period of stagnation is eliminated, and finally much of the loss will be recouped by buying at fair prices and selling in the inevitably increasing market that will result from the normal operation of the law of supply and demand under prosperous conditions."

In its conclusion, the statement of the board promises that its activities will be only temporary. This conclusion follows:

"It is expected that the activities of the board will be temporary and are intended only to give governmental assistance to aid the law of supply and demand in resuming its normal functions.

"The splendid co-operations of American industry during the war leads to the belief that it may continue and carry us safely through the trying period of readjustment. Surely with our fundamental conditions so sound, there is every reason to believe that we may bridge the gap between war and peace with the same courage and fortitude that always mark the American business man in his dealings with large affairs, and thus escape the unfortunate depressions which the country has suffered following previous wars. The offices of the board will be in the Council of National Defense Building, Eighteenth and D streets."

O. F. S.

Members Added to Committee

In addition to the members of the committee appointed to represent the American Iron and Steel Institute in co-operating with the Industrial Board of the Department of Commerce, as published on page 699 of this issue of THE IRON AGE, the following additional members have been appointed: Leonard Peckitt, Catasauqua, Pa., representing the merchant pig iron manufacturers; John A. Savage, Duluth, representing the iron ore interests; W. U. Follansbee, Pittsburgh, representing the sheet and tin plate manufacturers, and J. V. W. Reynders, New York, representing the class 3 manufacturers.

Pig Iron Distributers' Meeting

A meeting of the Merchant Pig Iron Distributers' Association was held in New York Monday of this week at which the conditions in the pig iron market were fully discussed. Owing to the high cost of manufacturing, and especially the high wages being paid, the prevailing opinion was opposed to a radical reduction in the price of pig iron at the present time. It was decided to suggest that a representative of the merchant pig iron interests be added to the special committee of the American Iron and Steel Institute appointed to co-operate with the Industrial Board of the Department of Commerce in the effort to stabilize business conditions. The recommendation was submitted to Judge Gary and approved by him and Leonard Peckitt, president Empire Steel & Iron Co., was added to the committee.

The bulletin of the Polytechnic Institute, of Brooklyn, N. Y., for March, 1919, explains in detail the industrial education, particularly in engineering, afforded by that institution. Numerous illustrations of the engineering laboratories are given showing the modern plant installations, designed for giving the students practical training in machine-shop, foundry and pattern shops, power plant, industrial and administrative practice.

Taylor-Wharton Iron & Steel Co. Record

Though 1917 had been the most profitable year ever experienced by the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., the record of 1918 was even better, according to the annual report presented to the stockholders March 4. After providing for taxes, possible future inventory losses, and other contingencies, earnings were equal to about 40 per cent applicable to common stock and surplus. Current liabilities increased by $637,000 over 1917, while current assets increased by $1,176,000.

It has been the policy of the company to suspend the payment of dividends on the common stock for the past few years. In regard to this the report states: "In view of our large earnings, the dividend of 3 per cent declared by our directors on Feb. 28 may seem small to some shareholders, but an increase at this time instead of a reduction, as so many concerns are making, should be encouraging to all."

The report continues: "The shell forging work at Easton enabled us to use the full capacity of our power house, and we are now starting new lines of products which will afford use for the power and machinery released by the termination of war work."

The High Bridge business consisted of making castings for gun mounts, powder mills, etc.; the street railway track business was diverted into manufacturing special steam track work for delivery in France. Because of the probable country-wide road-building the company expects a good demand for its manganese steel. Expansion of the railroads is also counted upon.

Last year about 300 men left the company's employ to enter Government service. Plans are being discussed to authorize additional bonds in order to leave only 25 per cent of new capital expenditures to be provided by earnings, instead of 100 per cent, as the situation now is.

STATEMENT OF EARNINGS

For the Year Ending Dec. 31, 1918

Profits of all companies, after deducting expenses of operating and maintenance, depreciation, selling and administrative expenses	$1,637,830.09	
Less:		
Interest on bonded debt	$162,155.00	
Interest on loans, etc.	104,011.90	
	266,166.90	
		$1,371,663.19
Provision for war profits and income taxes		240,000.00
		$1,131,663.19
Deduct—Amount appropriated to reserve for removal of plant and other contingencies		350,000.00
Surplus earnings for the year		$781,663.19
Add—Surplus, Dec. 31, 1917		1,076,559.95
		$1,858,223.14
Deduct—Dividends paid		163,341.00
Surplus Dec. 31, 1918		$1,694,882.14

Robesonia Iron Co. 125 Years Old

"One Hundred and Twenty-five Years of Pig Iron Manufacture at Robesonia, Pa.," is the title of a profusely illustrated booklet of the Robesonia Iron Co., Ltd., Philadelphia. The first pig iron was made at Robesonia in the Lebanon Valley district in 1793, the fuel being charcoal obtained from native timber. Today the plant, located on the same site, manufactures low phosphorus iron for use in the steel foundry trade. The present name is an outgrowth of the firm name of Robeson, Brooke & Co., which purchased the property in 1845. One of the striking photographs is that of the 125-year accumulation of slag, from which some of the modern employees' houses are built. The beauty of the scenery and the quaint houses, many of which are over 100 years old, give a picturesque impression.

New Bids on Steel for Battleships

WASHINGTON, March 11.—The Bureau of Supplies and Accounts of the Navy Department has asked supplementary bids for steel sheets and plates for battleships Nos. 49, 50, 51 and 52, and for a new navy fuel ship. These bids were originally opened Feb. 18, but they proved so complicated that no awards were made. Part of the steel also was to be delivered at Mare Island Navy Yard, Cal., to which the Government is entitled to lower freight rates because of the land grants to the transcontinental railroads. Only one company, the Carnegie Steel Co., took this matter into consideration.

This time all companies are asked to simplify their bids, to expedite the question of comparison. It is particularly specified that the new bids must state: "(a) base price, f.o.b. mill; (b) transportation charges from mill to navy yard; (c) extras shall be listed which are applicable so far as can be determined from the information given under the various items; bidders shall submit with their bids complete data as to the extras which they propose to charge; those data may be in the form of the standard card or leaflet issued by the bidder giving such extras; statement should be made of any applicable extras shown on the card or leaflet which the bidder does not propose to apply." The new bids will be opened March 21.

Ten Thousand By-Product Coke Ovens

Revised figures on the by-product coke industry of the United States and Canada, compiled by the Koppers Co., Pittsburgh, show that 10,039 ovens are now in operation and 1620 others are in course of construction and will probably be completed some time during 1919. The total coke-making capacity of the ovens now in operation is 38,077,200 net tons, with an annual coal consumption of 55,824,000 net tons, while the 1620 ovens now being built will have an annual coke-making capacity of 7,590,000 net tons and an annual coal consumption of 10,952,000 net tons. The ovens now being built are as follows:

Indiana Coke & Gas Co., Terre Haute, Ind., 60; Minnesota By-Products Coke Co., St. Paul, Minn., 65; Carnegie Steel Co., Clairton, Pa., 640; Bethlehem Steel Co., Steelton, Pa., 60; Colorado Fuel & Iron Co., Pueblo, Col., 120; Chattanooga Coke & Gas Co., Chattanooga, Tenn., 24; National Tube Co., Lorain, Ohio, 208; Dominion Iron & Steel Co., Sydney, Nova Scotia, 120; Steel Co. of Canada, Hamilton, Ont., 80; Ironton Solvay Coke Co., Ironton, Ohio, 60; American Steel & Wire Co., Cleveland, 180; Dover By-Products Co., Dover, Ohio, 24; Providence Gas Co., Providence, R. I., 40; Citizens Gas Co., Indianapolis, Ind., 40.

New Foreign Trade Corporation

Development of the iron, steel and allied industries in foreign countries is given an important place in the plans for a $25,000,000 foreign trade corporation which have been approved by the board of directors of the Chamber of Commerce of St. Louis and the formation of which by private capital is urged in a resolution of the board. Among the purposes of the organization which will be known as the St. Louis Trading & Navigation Co., as outlined in a provisional application for federal charter, are the following: To promote and engage in all countries in the development of the iron, steel, coal and petroleum industries and to obtain contracts and concessions for the exploitation thereof.

The stockholders of the A. Garrison Foundry Co. of Pittsburgh, at the annual meeting held recently, elected directors as follows: John H. Ricketson, Jr.; Oliver G. Ricketson, Jesse R. Williams, George W. Caulkett. The officers of the company are as follows: John H. Ricketson, Jr,. president; Oliver G. Ricketson, vice-president; Jesse R. Williams, general manager and treasurer; George W. Caulkett, secretary, assistant treasurer and assistant to the general manager. The president, John H. Ricketson, Jr., has been serving as a captain with the 315th Infantry, American Expeditionary Forces, in France. He was incapacitated by shell shock during the battle of the Argonne forest, but is now rapidly recovering. All of the officers are old employees of the company. The Messrs. Ricketson have held their present positions since the late 90's. Mr. Williams comes from the accounting department, while Mr. Caulkett is transferred from the engineering and estimating department.

Machinery Markets and News of the Works

BUSINESS IS IMPROVING

Bright Spots in Machine-tool Situation

Automobile, Tractor and Farm Implement Industries Largest Buyers—Greater Expansion Looked For

Business in machine tools in nearly all markets is being maintained at a rate that is surprising. Builders of standard, high-grade tools are booking a very satisfactory volume of orders, and while the business is made up of a considerable number of small lots, including many single tools, the aggregate is much better than was expected would develop by this time.

The automobile, tractor and farm implement manufacturing industries are the principal buyers, but the airplane industry is being built up on a commercial basis, and the recent aeronautical exposition in New York called attention to the possibility that the airplane industry may become of no mean importance as an outlet for machine tools. Of course, many of the plants were well equipped during the war, but replacements will be required, and in one instance, at least, a New England company has bought a small list of new tools for the manufacture of "flying boats."

Railroad buying on which considerable expectations had been based, is halted by the failure of Congress to pass the $750,000,000 railroad appropriation bill before adjournment, but if the railroads are financed by bankers, as now seems probable, this buying may not be long deferred. Many of the railroad shops are known to be badly in need of equipment, and in a number of instances good-sized lists have been made up, on which quotations will be wanted as soon as there appears definite prospect that equipment can be bought.

Things look very bright for the machine-tool trade in Chicago. Several large manufacturers have buying programs under consideration. The International Harvester Co. will equip a plant at Croix, France. The Nash Motors Co., Racine, Wis., has bought 35 acres of land adjoining its plant for enlargement, and will undoubtedly require new equipment to take care of an output of 25,000 cars planned for this year. The Allis-Chalmers Mfg. Co., Milwaukee, appears as a probable buyer of considerable equipment. The Crane Co., Chicago, will equip a new plant in France.

Business at Detroit and throughout the automobile manufacturing district of lower Michigan is at an exceptionally good rate. A Cleveland house one day last week received $175,000 worth of orders from Michigan, and this was made up largely of small lots. The Hudson Motor Car Co., Detroit, will devote the plant which was built during the war for shell manufacture to its new Essex automobile, 20,000 of which will be built this year. The board of directors of the company has authorized the expenditure of $1,000,000 for new equipment. It is also from Detroit that the General Motors Corporation will expend $1,000,000 for equipment for its Scripps-Booth Co. division.

At Cincinnati there has been improvement in domestic inquiry, and a fair lot of Japanese business has been closed. There are a number of inquiries from Spain in the market, and a few orders from France and England have been placed.

An interesting development is the possibility of some expansion in shipbuilding facilities. A new plant for the Great Lakes is being projected by the Wisconsin Shipbuilding & Navigation Co., Milwaukee, which has engaged the Thomas Engineering Co., New York, to design and supervise construction of a shipyard at Kewanee, Wis., to cost $400,000. The Moore Shipbuilding Co., San Francisco, is reported to have plans under way for expansion to cost $1,250,000. Revised plans for the structural shop at the United States Navy Yard at Mare Island, California, have been approved and this project, which, with equipment, will cost $1,500,000, may now go ahead.

Increasing industrial activity is noted in New England and a good share of the business which came to New York sellers last week was from that district.

Orders are being placed by the French High Commission, 65 Broadway, New York, for a list of tools, numbering from 100 to 150.

New York

NEW YORK, March 11.

The French High Commission, 65 Broadway, New York, has begun to buy some of the machine tools for which inquiries were made abut two weeks ago. Its purchases thus far include 16 boring mills. About 50 engine lathes, a considerable number of turret lathes, punching and shearing machines, planers and other large boring machines are included among the list to be bought. The purchases will total about 150 machines, according to report in the trade.

There has been a fair amount of machine-tool buying in New England during the past week. The Fellows Gear Shaper Co., Springfield, Vt., which has received large orders for its tools from the automobile manufacturers, has bought a good-sized list of new equipment. The Carlyle Johnson Machine Co., Manchester, Conn., manufacturer of friction clutches, has bought a small list of new tools. The Murray & Tregurtha Co., Boston, builder of engines and boats, and the Nelson Blower & Furnace Co., Boston, which will make tractors, have been buying some new equipment.

Business in machine tools is spotty. Some machine-tool builders are getting a very substantial list of orders. Others are doing well in certain territories—Detroit, for example—and almost nothing in other territories. A prominent machine-tool company last week sold through its New York office nearly $200,000 worth of tools for export and domestic shipments, this record comparing very favorably with war-time sales.

Export prospects continue to accumulate, but, aside from the orders placed by the French High Commission, and a few that have come from Belgium, little is actually being closed. James M. Motley, 71 Beaver Street, New York, has an inquiry out for 22 locomotive cranes and another for 12 portal cranes for export. Otherwise there is little doing in the crane business, and the few inquiries that have been before the builders for weeks are not being closed. There are very few new inquiries.

The Standard Oil Co. of New Jersey has not yet bought the machines it inquired for to ship to Rumania, and several other large export inquiries are pending. Some large orders for France are expected when financial arrangements have been concluded.

The Pennsylvania Railroad, Pennsylvania Terminal, New York, is arranging for the rebuilding of its boiler plant and auxiliary steam buildings, at the railroad yards, South Amboy, N. J., recently destroyed by fire.

The [illegible] & Silverstein Iron Works, 4010 Park Avenue, New York, has been dissolved.

[illegible] Brothers, 438 West Thirty-seventh Street, New York, manufacturers of bronze powders, etc., are planning a [illegible] plant on Canal Street, Stamford, Conn.

The [illegible] Co., New York, has been incorporated in Delaware with a capital of $100,000 by Francis T. Sargent, [illegible] Bently, New York, and Vernon C. Ryder, Brooklyn, to manufacture fire extinguishers and fire-protecting apparatus.

The [illegible] Electric Corporation, New York, has been incorporated with a capital of $150,000 by T. L. Ernst, F. [illegible] Lawrence and R. A. McLean, 318 Seventy-fourth Street, to manufacture electric machinery and apparatus.

The Foundation Oven Corporation, New York, has been incorporated with a capital of $300,000 by L. M. Woodworth, W. H. Keefe and J. D. Merriman, 2 Rector Street, to manufacture brick, operate stamp mills, etc.

The property of the Traun Rubber Co., 239 Fourth Avenue, New York, a New Jersey corporation, will be sold by A. Mitchell Palmer, Alien Property Custodian, on March 20.

The Wager Furnace Bridge Wall Co., Inc., 149 Broadway, New York, has increased its capital from $100,000 to $500,000.

Barclay-Dean, Inc., New York, has been incorporated with a capital of $10,000 by W. W. Peacock, I. E. Gorry and [illegible] Barclay, 347 Fifth Avenue, to manufacture railroad and marine supplies.

The property of the American Metal Co., Ltd., 61 Broadway, New York, will be sold by A. Mitchell Palmer, Alien Property Custodian, on April 7.

Waterbury-Carey, Inc., New York, has been incorporated with a capital of $50,000 by J. M. Keyser, W. Swain and R. [illegible] 66 Wall Street, to manufacture farm tractors, auto parts, etc.

The fire at the star illuminating shell plant at Baldwin, Long Island, Feb. 26, occurred in the United States Naval ordnance works at this location, insfead of the plant of the Ordnance Engineering Corporation, as previously announced. This latter company constructed the plant for the Government, and was interested in operation up to Nov. 25, 1918, when its contract with the Navy Department was canceled.

The Kelly-Springfield Tire Co., 200 West Fifty-seventh Street, New York, is arranging for an increase in its capital from $5,029,900 to $10,000,000. The company operates plants at Akron and Wooster, Ohio, and Buffalo, N. Y. Van H. Gartsell is president.

A. Bataille & Co., New York, operating a wire works at 567 Hudson Street, have incorporated as A. Bataille & Co., Inc., to manufacture grill metal work, elevator enclosures, etc., with capital of $50,000. The incorporators are [illegible] H. Meyer, J. H. Brown and A. Bataille, 564 Hudson Street.

The Gaston, Williams & Wigmore Electrical Engineering Corporation, 39 Broadway, New York, a Delaware corporation, has increased its capital from $500,000 to $1,000,000.

The Essex Engineering Co., Belleville, N. J., has been incorporated with a capital of $10,000 by Eugene and Daniel Mayer, and Sigmund Cohn, to manufacture tools.

Mack & Philpot, Atlantic City, N. J., are planning a machine shop, 50 x 100 ft., estimated to cost $[illegible].

The John J. Peters Machine Works, Perth Amboy, N. J., has been incorporated with a capital of $125,000 to manufacture clay-digging machinery, etc. John J. Peters, Fords; Harry Brower, Max Gibian and Thomas L. Hanson, Perth Amboy, are the incorporators.

The Hart Roller Bearing Co., 512 Main Street, East Orange, N. J., is having revised plans prepared for its proposed plant at Main and North Jefferson streets, to provide for increased output.

The Filtre Barrel Co., Hackensack, N. J., has been incorporated with a capital of $300,000 by John Vasilyk, Victor A. and Archibald C. Hart.

The Granite Co., 501 Fifth Avenue, New York, manufacturer of insulated wire, with plant on Canal Street, Passaic, N. J., has increased its capital from $650,000 to $[illegible].

The Califon Electric Light & Power Co., Califon, N. J., has been incorporated with a capital of $100,000 by Kinzie, [illegible] L. M. Apgar, to construct and operate a local plant.

The Metals Plating Co., 511 Fifth Avenue, New York, a New Jersey corporation, has filed notice of change of name to the Copper Plate Sheet & Tube Co. It has also increased its capital from $300,000 to $1,000,000.

George G. Tennant, 15 Exchange Place, Jersey City, N. J., trustee for Dailey & Ivins, New York, operating contractors' plants on Rikers Island, Hunts Point and Staten Island, will sell the property at the Federal Court Room, Postoffice Building, Jersey City, 12 noon, March 17. The sale will comprise four plants, two on Rikers Island, with industrial equipment including forge and blacksmith shops, locomotive, side dump cars, land hoister, orange peel bucket, etc.; one plant at Hunts Point, with similar equipment, and the fourth at Port Ivory, Staten Island, including three locomotives, 25 12-yd. side dump cars, forge shop equipment, etc.

The Button Machinery Co., 1023 Clinton Street, Hoboken, N. J., has increased its capital from $100,000 to $200,000.

The Knoburn Co., 359 Fourteenth Street, Hoboken, N. J., manufacturer of fireproof doors, windows, etc., is planning to rebuild its works destroyed by fire early in February, with a loss of about $100,000. It will occupy a temporary factory in the vicinity meanwhile.

The Simmons Co., 80 Madison Street, Newark, N. J., manufacturer of iron and brass beds, etc., has acquired a large site on Wilson Avenue for a plant to consist of four six-story reinforced-concrete and steel structures, one 80 x 400 ft., and three 80 x 700 ft., with one-story rolling mill. The different buildings will comprise machine shop, finishing works, assembling department and main manufacturing plant. Headquarters are at Kenosha, Wis.

The Mono Service Co., Oraton Street, Newark, N. J., manufacturer of moisture-proof containers, has increased its capital from $300,000 to $500,000.

The Johnson Shipyard Corporation, Richmond Terrace, Mariners Harbor, West New Brighton, Staten Island, has had plans prepared for a one-story machine shop extension, 50 x 100 ft.

The Deline Engineering Co., Inc., Brooklyn, has been incorporated with a capital of $50,000 by S. V. Coles, E. H. and O. A. Deline, 171 Clymer Street, to manufacture foundry equipment, marine supplies, etc.

George R. Swart & Co., New York, have been incorporated with a capital of $50,000 by George R. Swart, H. F. Harrison and A. W. Robertson, Mount Vernon, N. Y., to manufacture printing and bookbinding machinery.

The Clinton Dry Docks, New York, has been incorporated by H. R. Dawson, C. R. Delmage and E. Vandewater, 177 Montague Street, Brooklyn, with capital of $2,000,000.

Bids are being taken for the furniture manufacturing plant to be erected by S. Karpen & Brother, 68 West Thirty-fourth Street, New York, at Long Island City, N. Y., at an estimated cost of $750,000. It will be six stories, reinforced-concrete, to be located on Jackson Avenue near Hulst Street. Ballinger & Perrot, 1328 Broadway, are architects.

The Lease Brothers Motor Co., Inc., New York, has been incorporated with a capital of $50,000 by L. Levine, R. and R. M. Lease, 240 West Forty-ninth Street, to manufacture and repair auto parts, tools, etc.

The Watervliet Tool Co., Watervliet, N. Y., manufacturer of tools, etc., has increased its capital from $10,000 to $25,000.

Philadelphia

PHILADELPHIA, March 10.

Following the cancellation of contracts for the construction of a number of vessels by the Emergency Fleet Corporation, Washington, the Pusey & Jones Co., Gloucester City, N. J., has suspended work temporarily at the plate and angle shop and mold loft at the New Jersey yard, affecting about 300 men. The material for the vessels had been laid out, but no keels laid.

The Artillery Tire & Rubber Co., Philadelphia, has been incorporated in Delaware with capital of $500,000 by E. M. MacFarland, F. R. Hansell and J. V. Pimm, to manufacture rubber products.

Walter H. Tinney, Philadelphia, will build a one-story addition to his sheet metal works on Farrel Street, about 115 x 150 ft.

Abraham Sharp, 5237 Baltimore Avenue, Philadelphia, has filed plans for a new two story brick machine and auto repair shop, with garage department, 60 x 125 ft., at Fifty-third Street and Thomas Avenue, to cost $10,000.

The Pennsylvania Equipment Co., Crozier Building, Philadelphia, is understood to be in the market for a number of 50-ton automatic air dump cars.

The S. S. White Dental Co., 211 South Twelfth Street, Philadelphia, has filed plans for a one-story, brick addition at Tackawanna and Gillingham streets, 20 x 36 ft.

The Pennsylvania Steel & Iron Corporation, Plum and Ann streets, Lancaster, Pa., will make improvements in its two-story works to cost about $5,000.

To provide for the construction of its proposed municipal electric power plant, the City Council, Allentown,

Pa., is having estimates of cost made. Frank Koester, 50 Church Street, New York, is engineer.

The Royal Tire & Rubber Co., Mahonington, Pa., has been incorporated in Delaware with capital of $50,000 by H. L. Fry, T. C. Bollard and K. King, all of Mahonington, to manufacture tires, etc.

The American Brake Shoe & Foundry Co., 30 Church Street, New York, it is reported, will dispose of its plants at Corry and Uniontown, Pa. The Corry works consist of a one-story foundry and machine shop, with about 16,000 sq. ft. of operating area, while the Uniontown plant comprises a one-story foundry with auxiliary structures, totaling about 28,000 sq. ft. of floor space.

The Silvex Co., South Bethlehem, Pa., manufacturer of spark plugs, has resumed operations at its plant on a pre-war basis. During the war period about 90 per cent of production, totaling 18,000 spark plugs per day, was used for Government service, including special plugs for airplane motors.

The Ingersoll-Rand Co., 11 Broadway, New York, has completed plans for its proposed one-story brick machine shop at Athens, Pa., to be about 112 x 240 ft., and estimated to cost about $50,000, with equipment.

Buffalo

BUFFALO, March 10.

The Polson Mfg. Co., Main Street and Lafayette Avenue, Buffalo, manufacturer of automobile tops and accessories, will add a third story to its factory, to cost $15,000.

Fire destroyed the interior of the factory of the Niagara Falls Metal Stamping Co., Tenth Street and Angelo Court, Niagara Falls, N. Y., March 7, with a loss of $75,000. E. E. Fowler is general manager.

The Buffalo Dry Dock Co., Buffalo, will proceed at once with the erection of a punch shop to cost $20,000 at its plant on the Buffalo River and Ganson Street.

The city of Watertown, N. Y., is having plans prepared for a municipal electric lighting plant, estimated to cost $300,000. Isaac R. Breen, chairman, City Hall. Architect and engineer, Thoms L. Tomlines, City Bank Building, Syracuse, N. Y.

The J. S. Spaulding & Sons Co., Tonawanda, N. Y., manufacturer of fiber board, will build a five-story paper mill addition to its plant on Wheeler Street, to cost, with equipment, about $500,000.

Dwight, Divine & Sons, Ellenville, N. Y., proprietors of the Ulster Knife Works, have completed plans for a factory building, 45 x 86 ft.

The Utica State Hospital, Utica, N. Y., will add a boiler room and pump and engine room, estimated cost, $10,000. H. L. Palmer, Capitol, Albany, is superintendent.

The Onondaga Metal Bed Mfg. Co., Syracuse, N. Y., has purchased a five-story building on East Water Street, to which it will remove.

The Harvey Rim & Wheel Co., Buffalo, has been incorporated with a capital of $10,000,000 by W. B. Allison, G. E. and L. B. Harvey, to manufacture steel automobile rims, wheels, etc.

The Buffalo Chair Works, 383 Babcock Street, Buffalo, will sell its local four-story brick manufacturing works, 100 x 200 ft., providing 90,000 sq. ft. of manufacturing area.

The Cadwell-Vernon Co., 115 Foote Avenue, Jamestown, N. Y., has filed notice of change of name to the Cadwell Machine Co.

The Rochester State Hospital, Rochester, N. Y., is planning an addition to its electric power plant to cost about $70,000. Dr. E. H. Howard is superintendent.

The New Idea Double Tire Co., 30 Spring Street, Rochester, N. Y., manufacturer of automobile tires, has increased its capital to $20,000.

The Colonial Multiphone Corporation, Rochester, N. Y., has been incorporated with a capital of $500,000 by B. W. Smith, G. T. Haines and A. T. Folts, to manufacture talking machines.

Revised plans are being prepared by the Remington Salt Co., Ithaca, N. Y., for rebuilding its boiler plant on Cayuga Lake, recently destroyed by fire, and is estimated to cost $25,000.

The Rome State Custodial Asylum, Rome, N. Y., is planning for increased capacity to the electric power plant, to cost about $20,000, new stokers and other equipment at the boiler plant to cost about $10,000, and new machine and repair shops costing about $20,000. Charles Bernstein is superintendent.

The J. A. Bort Mfg. Corporation, Fulton, N. Y., has been incorporated with a capital of $100,000 by O. Moore, E. M. and J. A. Bort, to manufacture machinery.

The proposed foundry addition at the plant of the Sawyer Brass & Iron Foundry Co., Oswego, N. Y., will be 65 x 165 ft., and is estimated to cost $50,000.

The Lowry-Knise Tool Co., Syracuse, N. Y., has increased its capital from $10,000 to $20,000.

The Finney & Fuller Co., Utica, N. Y., has been incorporated with a capital of $25,000 by G. W. and M. B. Finney, New Hartford, and I. C. Fuller, Whitesboro, to manufacture machinery, hardware, etc.

Baltimore

BALTIMORE, March 10.

The Aluminum Ore Co., subsidiary of the Aluminum Co. of America, New York, is understood to be planning the completion of a large plant at Sollers Point, Md., upon which work was stopped because of the war.

The Eureka Auto Repair Co., Baltimore, will establish a repair shop at 1026 Wilcox Street.

Ray G. Reed will install a 30-hp. boiler at 2304 Frederick Avenue.

The Harvey Co., 113 South Street, Baltimore, wants prices on 120-hp. portable boilers, 150-hp. return tubular boilers, 8 x 12 three-drum hoisting engines with swingers, 42-inch standard gage Shay locomotives, and double-header punches and shears.

Charles D. Briddell, Crisfield, Md., will build a one-story factory, 50 x 100 ft., for the manufacture of knives and other cutlery. Later he will be in the market for machinery and equipment.

The following charters have been filed at Dover, Del.: Wightman Concrete Machinery Co., Wilmington, $100,000; Bessemer Motors Corporation, Wilmington, $500,000; Ever Ready Iron Co., Pittsburgh, $100,000; Savannah Dry Dock & Repair Co., Wilmington, $1,500,000; Service Plate Co., Wilmington, $50,000.

The Steel Castings Corporation, Altavista, Va., plans to erect an addition to its plant for the manufacture of razor and scissor blades.

The Bain Peanut Co., Norfolk, Va., wants prices on 200-hp. Corliss engines and generators.

The Board of Awards, City Hall, Baltimore, is receiving bids for the installation of a 20,000,000-gal. turbo-centrifugal pump and other equipment at Mount Royal pumping station.

The Oxford Body Co., Oxford, N. C., wants prices on 30-hp. motors.

R. L. Riggs, Charleston, S. C., will build a garage and auto repair shop.

The Adams Machinery & Mfg. Co., Mobile, Ala., plans to build a machine shop and garage.

Prices on electric light plant equipment are wanted by Evans & Brown, Florence, Ala.

O. Rubin has disposed of his interest in the Duval Iron Works, Jacksonville, Fla., and has purchased new machinery and fitted out a shop in the rear of 128 West Bay Street for machine, blacksmith and boiler work, and also oxy-acetylene welding.

The Raymond Concrete Pile Co., Munsey Building, Baltimore, will build a one-story machine shop at Colgate Creek, in connection with its new bulkhead.

The works of the Baltimore Machine & Decorating Co., First and Ninth streets, Baltimore, were partially destroyed by fire recently with loss estimated at $25,000.

The F. H. Linthicum Bronze Foundry, 325 East Oliver Street, Baltimore, is considering the erection of an addition.

Preliminary plans are under way at the office of Norton, Bird & Whitman, Munsey Building, Baltimore, engineers, for a ship repair works to be located at Spring Garden. The plant will consist of ship ways, drydocks, plate and angle shop, foundry, machine shop, warehouse and general construction buildings, to be fully equipped for repair and construction work on steel vessels. The initial plant is estimated to cost over $2,000,000. Frank Furst of the Arundel Sand & Gravel Co., is interested.

The Delaware Dry Dock & Shipbuilding Co., Wilmington, Del., has been incorporated with a capital of $1,000,000 by C. Hoilig, H. M. Lucey and E. V. Felton.

C. L. Ward, Central Realty Co., 901 Market Street, Wilmington, Del., will build a new two-story machine shop, 60 x 100 ft. and 40 x 90 ft., at Orange and Eleventh streets. Bids have been asked.

The Oridge-Weathers Motor Co., Greensboro, N. C., has been incorporated with a capital of $125,000 by W. W. Oridge, E. B. and H. M. Weathers, to do a garage business, etc.

The T. B. Ross Lumber Co., Spartanburg, S. C., is plan-

ing to rebuild its wood-working plant, recently destroyed by fire with loss estimated at $30,000.

H. L. and W. A. Carver, Rougemont, N. C., are planning for a hydroelectric power plant near Rougemont for local industrial service.

The Pittman-Spivey Motor Corporation, Richmond, Va., has been incorporated with a capital of $50,000 by G. S. Pittman, C. Q. Spivey and W. D. Saunders, to manufacture and repair motor cars and parts.

The Winter Haven Wagon Works, Winter Haven, Fla., will build a one-story extension, about 30 x 32 ft., for a tire shop, and will install new machine shop equipment, welding apparatus, etc. Henry A. Marks heads the company.

The Hanson Motor Co., Atlanta, Ga., has recently increased its capital from $500,000 to $1,000,000, and plans additions to increase present capacity.

Pittsburgh

PITTSBURGH, March 10.

The Demas Armor-Cased Tire Saving Co., Pittsburgh, recently organized, will commence operations at its proposed plant at Dorseyville, acquired from the Pittsburgh Tire Co. It consists of three main buildings with total area of 25,000 sq. ft., and will be devoted to the manufacture of tires. Over 100 persons will be employed.

The Duquesne Light Co., Pittsburgh, is planning the immediate erection of a one-story machine shop, 25 x 96 ft., at its power plant on Brunots Island.

The Ever Ready Iron Co., Pittsburgh, has been incorporated in Delaware with capital of $100,000 by A. M. Groves, Mathias Mahlen and George L. Hall, to manufacture iron and steel.

The Valvoline Oil Co., 60 Broadway, New York, is arranging for the rebuilding of its cooperage works, etc., at Butler, Pa., recently destroyed by fire with loss estimated at $75,000.

The United States Engineering Department, Pittsburgh, is arranging for the construction of six barges, each 26 x 100 ft., and a pump boat at the Government boat-building works at lock No. 4 on the Monongahela River.

The Kanawha Collieries Co., Charleston, W. Va., is planning the construction of an electric power plant at its coal properties for operating service. H. P. Tompkins is general manager.

The Bluefield Motor Co., Bluefield, W. Va., has been incorporated with a capital of $25,000 by L. A. Tynes, Tazewell, Va.; J. R. Laird, F. R. Christie and James S. Kahle, Bluefield, to manufacture and repair auto parts, equipment, etc.

The Service Auto Equipment Co., Wheeling, W. Va., has been incorporated with a capital of $50,000 by W. J. Anawalt, H. L. Eckhart and Henry S. Shaefer, to manufacture and repair auto parts and specialties.

The Texas Co., 17 Battery Place, New York, will build a new one-story boiler plant at its oil plant at Bluefield, W. Va.

The Guyan Machine Shops, Logan, W. Va., wants prices on belt-driven air compressors, 10 to 20-hp. gas engines, electric gasoline and motor-driven hoists and drums, milling machines, gear cutters, bolt machines, motors, and cold-rolled shafting.

Chicago

CHICAGO, March 10.

The business of a representative machine-tool house in January and February proved better, on comparison, than in the corresponding months of 1917, though not so good as in the same months of 1918. In general, business continues good, but that is surprising, buyers in the main being the automobile tractor and agricultural implement makers, while there is a good sprinkling of small purchasers who want one or two machines for new enterprises. These latter sales are most favorably regarded, for a scattered business is a good thing and creates prospects for the future.

Large steel mills have made inquiry and in some cases have done some buying, among them being the Illinois Steel Co., Union Steel & Tube Co. of America and the Interstate Iron & Steel Co. Naturally heavy tools are wanted.

The situation in second-hand tools is one denoting firmness. At a recent sale of machines formerly used by the Chicago Carpenter Co., maker of drilling machines, there were more buyers than tools, and the prices obtained at times were too high to interest dealers.

A large sale of used tools is to take place at Indianapolis, March 18, when the equipment of the Stenotype Co. is to be sold. It is inventoried at nearly $1,000,000. A great deal was used in the manufacture of war munitions.

Dealers are complaining over the inconvenience they are suffering as the result of delay in the settlement of war claims against the Government. Many prime contractors not having been compensated, the sub-contractors have not received their money, and neither of them, in many instances, have paid for the equipment purchased to do the work. More action is expected now that the contract validation bill has been signed by the President. With some claims, where formal contracts existed, some delay is attributed to close inspection given by the Government's inspectors to labor items. As to the cost of materials and equipment used there can be little question, but a large percentage of the claims consists of heavy cost for labor, and these are carefully checked.

The machine-tool trade feels that a set-back has been given to railroad buying of tools by the failure of Congress to appropriate $750,000,000 for the roads. Some good lists were known to be in process of preparation. Shop men know what tools they want and are eager to get them.

The Maine Brothers Mfg. Co., Estherville, Iowa, maker of pianos, is equipping its factory to do screw machine work, also wire forming, the intention being to make products which have heretofore been purchased. Jobbing work will also be done.

Armour & Co., Chicago, are planning for the immediate erection of a new four-story boiler plant at their works at South Omaha, Neb.

The Blackhawk Tire & Rubber Co., Hippee Building, Des Moines, Iowa, is having plans prepared for a new two-story and basement works, 110 x 210 ft., on East Twentieth Street, near Capitol Street, to cost $90,000.

The Skillin & Richards Mfg. Co., Cortland Street, Chicago, manufacturer of transmission equipment, is planning for the construction of a two-story addition, 125 x 200 ft., to cost $75,000.

The Signode Systems, Inc., 108 West Lake Street, Chicago, has increased its capital from $225,000 to $325,000. The company specializes in the manufacture of metal box straps.

The City Tire & Mfg. Co., Sioux City, Iowa, has awarded a contract to F. J. Sulzbach, Sioux City, for the erection of an addition to cost about $100,000.

The H. A. Frank Foundry & Machine Co., Moline, Ill., has commenced the erection of a two-story addition, 50 x 80 ft., to cost $15,000.

New England

BOSTON, March 10.

Announcement that the Colts Patent Fire Arms Mfg. Co., Hartford, Conn., has contracted with the Federal Adding Machine Co., New Haven, Conn., to build for the latter some 50,000 machines, requiring 1000 workmen, is a very encouraging trade factor. The contract involves about $1,500,000. Balance being required of an order for 18,000 Browning automatic rifles on a Federal contract, a task demanding 3000 men until June 1, has also boosted activities in the plants of the Marlin-Rockwell Corporation in New Haven, Conn., and Plainville, Conn. Men have also been recalled to the Remington Arms plant at Bridgeport, Conn., to complete war orders. The result has been that, as intimated a week ago, the ebb or recession seems to have reached the limit; for example, Hartford's two largest plants retained their forces intact for a week, a condition not previously known to happen since the armistice. General Manager Edwin O. Cutler, Groton Iron Works, Groton, Conn., says that larger ships, of 9400 tons, are to be built following the construction of the first six. Settlement of wage grievances at the West Springfield, Mass., shops of the Boston & Albany Railroad is in prospect; at least the local agent of the machinists' union and the Federal Director have agreed to pass the matter up for a hearing before the Railroad Adjustment Board at Washington. The New England Westinghouse Co.'s factories at East Springfield, Mass., and Chicopee Falls, Mass., have about 2000 employees at work on rifles and shotguns and spare parts for Browning machine guns. These plants, originally bought for making guns for the Russians, were then devoted to British war contracts, and subsequently took up the handling of work for the United States Government. It is expected that the present order for war purposes will be exhausted May 1.

During the last year, the Chase Metal Works, the Chase Rolling Mill Co. and the Waterbury Mfg. Co. of Waterbury, Conn., have been occupied with practically 80 per cent war work. It was not necessary to change the general character of their products or equipment to any noticeable degree. They have extended the plants more rapidly than they would under normal conditions and during a natural growth

The products of their manufacture will continue generally the same. The regular commercial demands are already beginning to return with the readjustment of the market. It is uncertain whether there will ever be a demand for the product of a 23-hr. working day from these or the other metal-producing and cutting-up plants of the country, but a normal one-shift day for every plant seems possible. The working force and output have increased four-fold in the last five years. The Naugatuck Valley of Connecticut is affected by the brass industry only. Labor, along with other factors, follows the tendency of conditions surrounding this metal. The increased cutting-up facilities of the country will, in and of itself, create a demand for raw metal products. Whether production will be for a real demand remains to be seen. It does seem possible, however, that there will be an expansion of the normal lines of commerce.

The Berkshire Sheet Metal Works, Pittsfield, Mass., sustained a $5,000 loss by fire on March 2.

The Heywood Brothers & Wakefield Co., Gardner, Mass., contemplate the erection of a new factory building, 60 x 200 ft., four stories.

The upper floor of the three-story building, 40 x 200 ft., was seriously damaged by fire on March 8, at the plant of the Belcher & Taylor Agricultural Tool Co., Chicopee, Mass.

The Scovill Mfg. Co., Waterbury, Conn., is making alterations at a cost of $2,500, to a factory building.

The Murray & Tregurtha Co., South Boston, Mass., has awarded a contract for building a machine shop addition, one story, 60 x 200 ft., at Quincy, Mass.

The Fairhaven Mills Corporation, New Bedford, Mass., will make alterations to boiler house, to cost $10,000.

The Park and Recreation Department, Boston, Mass., is to spend about $10,000 on a machine shop at Fort Independence, Castle Island, South Boston District.

Contracts have been awarded for the $500,000 factory addition in the South Boston District for the Gillette Safety Razor Co., Boston, Mass.

Hangars and all necessary equipment at Boston are under consideration for the air mail route service of the United States Post Office Department, and will in that locality alone involve the expenditure of some $25,000. Dr. L. T. Bussler is superintendent, Post Office Department, Twelfth and Pennsylvania Avenue, N. W., Washington, D. C.

The Passaic Cotton Mills Co., New Bedford, Mass., has begun the erection of a one-story brick machine shop, 36 x 69 ft., to cost $10,000.

Work has been started on the new foundry, one story, 100 x 160 ft., brick, for the Connecticut Foundries Co., Rocky Hill, Conn.

Plans are being prepared for a reinforced-concrete factory building, four stories, 40 x 200 ft., for Scott & Williams, Laconia, N. H.

A frame structure, $10,000, one-story, 80 x 100 ft., for factory purposes, is under erection at Taunton, Mass., by the Morse & Sprinkler Co., New York. Electricity will be used for power and will be purchased from local supply.

The Racicot-Richard Cutlery Mfg. Co., Webster, Mass., is fitting up a plant for making machine knives for cutting leather, rubber, etc.

The Morgan Spring Co., Worcester, Mass., has let contract for a one-story structure, 41 x 73 ft., $3,000, for rolling-mill purposes.

The American Graphophone Co., Bridgeport, Conn., has purchased about four acres of land adjoining its present property. There are three brick buildings on the site, one containing 15,000 sq. ft. Development plans are under consideration, though not ready for announcement in detail.

The Waterbury Motor Co., Waterbury, Conn., has been incorporated with a capital of $25,000 by James E. and Patrick J. Lawlor and Humbert E. Mangini, to manufacture auto parts, supplies, etc.

The Worcester Pressed Steel Co., Worcester, Mass., will operate a department of its works for the manufacture of 37-mm. cartridge cases for the Ordnance Department. The production will aggregate over $200,000.

The Phoenix Tool & Machine Co., Providence, R. I., has been incorporated with a capital of $20,000 by Hugo A. Clason, M. G. English and Thomas Curran, to manufacture tools and machinery.

The Simplex Player Action Co., 13 Blackstone Street, Worcester, Mass., has awarded a contract to E. D. Ward & Co., Foster Street, for the erection of three additions to its plant. One building will be four-stories, 50 x 55 ft., and the other two, one-story, 35 x 115 ft.

The Babcock Printing Press Mfg. Co., New London, Conn., has increased its capitalization by an amount of $440,100.

The Excello Mfg. Co., Providence, R. I., has been incorporated with a capital of $50,000 by George [illegible] Cranston, and Aylesworth Brown and George [illegible] Providence, to manufacture jewelry.

The Marine Engineering & Drydock Co., [illegible] will build a one and two-story addition, 60 x [illegible] used in part as a machine shop.

The Connecticut Foundry Co., Rocky Hill, [illegible] ning for the immediate construction of a [illegible] foundry and pattern shop, 100 x 150 ft., [illegible] It will be situated on the site of the former [illegible] the Foster-Merriam Co.

The Coon Harvester Co., Woonsocket, R. I., has been incorporated with a capital of $100,000 by Arthur J. Coon, Clifford A. Kingsley and Harold P. Salisbury, Providence, to manufacture harvesting machinery.

The Providence Body Co., Providence, R. I., automobile body manufacturer of automobile bodies, is planning for the erection of a one-story extension, 80 x 200 ft., on Elmwood Avenue. J. H. Monahan is general manager.

Milwaukee

MILWAUKEE, March [illegible]

The moderate expansion of metal-working industries since the reversion to a peace basis is regarded by machine tool manufacturers as an excellent sign that the situation is progressing toward a nearly normal condition. While the immediate demand for machine tools is not broad or pressing, the tone of buying improves from day to day.

The milling machine demand remains somewhat spotty, most of the business coming from the automotive industries. Orders are being received for single tools or lots of two, three or four machines, with here and there a requirement of more moment appearing.

The local labor situation is largely a question of disposing of unskilled workers. Skilled labor for foundries and machine shops is not in excess supply; in fact, not all orders received by the local employment bureau can be filled immediately. The situation is considered relatively satisfactory.

The Wisconsin Shipbuilding & Navigation Co., Milwaukee, has engaged the Thomas Engineering Co., 133 Liberty Street, New York, to design and supervise the construction of its proposed new plant at Kewanee, Wis., on Lake Michigan. The initial investment will be approximately $100,000. The capacity of the yard will be six steel vessels a year, provision being made for a total of 12 ways, half of which will be constructed at once. The drydock will be of reinforced concrete and steel, 600 ft. long. The company hopes to be able to start actual work shortly after April 1, so that the plant may be ready to lay keels by mid-summer, and sufficient business has been secured to keep it busy for more than a year. The company has an authorized capital of $5,000,000. Paul E. Thomas, president Kempsmith Mfg. Co., Milwaukee, is president.

The Carl Hartmann Co., Green Bay, Wis., marine engineer and ship repairer, has commissioned Morrison & Beck, consulting engineers, 140 South Dearborn Street, Chicago, to prepare plans for a new floating drydock, 630 ft. long and 80 ft. wide.

The B. Hoffmann Mfg. Co., 257 Sixth Street, Milwaukee, manufacturer of steamfitters' and plumbers' materials, pipe and iron and brass castings, will build a three-story shop, 40 x 100 ft., of brick, concrete and heavy mill construction, to replace the one destroyed by fire several weeks ago. The general contract has been awarded to H. Schmitt & Son, 422 East North Avenue, Milwaukee.

The United States Tractor Co., Chicago, which has been manufacturing tractors in leased quarters for nearly two years, has practically concluded arrangements to transfer its plant and headquarters to Menasha, Wis. Business men of Menasha have agreed to invest $50,000 in the company and provide a site for a proposed factory, the first unit of which is planned to be 60 x 125 ft., of brick and concrete, one story.

The Sivyer Steel Casting Co., Milwaukee, has purchased five lots adjacent to its foundry group near Thirty-seventh Avenue and Burnham Street, West Milwaukee, to provide for future extensions. The company does not contemplate immediate improvement of the site.

The A. H. Stange Co., Merrill, Wis., hardwood and pine lumber manufacturer, is contemplating the erection of a new saw and planing mill at Star Lake, Wis., estimated to cost about $45,000. An engineer has not yet been selected. Charles H. Stange is secretary and treasurer.

The Lull Truck Co., Wausau, Wis., organized a year ago to acquire a motor truck design of the quadruple drive type and which has conducted an experimental shop, intends to provide facilities for quantity production. A request has been made to the Common Council for the use of a 50-acre

...ing an unfinished manufacturing building, with the privilege of purchasing within three years. The company expects to complete the structure and install the necessary equipment and machinery. Karl Mathis is secretary and treasurer.

The Algoma Veneer & Seating Co., Algoma, Wis., has increased its capital stock from $160,000 to $600,000 and changed its corporate title to Algoma Panel Co. It intends to make an addition and install new veneer and other wood-working machinery and motors. M. W. Perry is president and general manager.

The Janesville Products Co., Janesville, Wis., manufacturer of automobile specialties, has awarded contracts for the erection of a two-story brick addition, 40 x 85 ft., costing about $18,000.

The Harding Machine Works, Oshkosh, Wis., has a large order for special machinery from a Chicago interest, and will begin work on the contract as soon as its present Government contracts have been completed. The new order will keep the plant busy for several months, and probably will require some additional equipment.

The K. & F. Mfg. Co., Kenosha, Wis., maker of metal specialties, intends to build an addition or a complete new plant. Tentative plans and estimates are being prepared. A. H. Folien, 214 Exchange Street, is general manager.

The J. Sorenson & Co., LaCrosse, Wis., manufacturers of bank fixtures, interior finish, etc., will build a new factory and power plant costing about $40,000. Contracts will be awarded after March 15.

The Badger Sheet Metal Works, Milwaukee, has been organized by N. Yampol and H. Luban, and is establishing a shop at 1323 State Street for the manufacture of cornices, skylight work, fireproof doors, automobile fenders and radiators. All equipment required for the present has been purchased.

The Cream City Trimming Co., 73 Juneau Avenue, Milwaukee, manufacturer of automobile and truck cabs, tops, hardware, etc., has acquired the two-story building at Market and Martin streets, and will remodel it into a factory and smithy at an estimated cost of $15,000, including new machinery and equipment. James Foreman is general manager.

The Conradson Machine Tool Co., Green Bay, Wis., has awarded the general contract to H. J. Semer & Co., builders, Green Bay, for a machine shop, 125 x 200 ft.; erecting shop, 65 x 225 ft., and power house, 40 x 50 ft. The investment in buildings and equipment will be about $200,000. The company will manufacture turret lathes and other machine tools designed by C. M. Conradson, vice-president and general manager.

The James Mfg. Co., Fort Atkinson, Wis., has tentative plans and sketches for a three-story addition, 78 x 132 ft., and an iron and steel casting shop, 70 x 295 ft., to be erected at the main works in Fort Atkinson or at the branch plant in Elmira, N. Y. The company manufactures steel stanchions and other barn and stable equipment. W. D. James is secretary-treasurer and general manager.

The National Auto Wheels Corporation, 409-411 Jackson Street, Wausau, Wis., manufacturer of patented steel and wood motor vehicle wheels using solid tires, is preparing to increase its output. The plant will be enlarged and some new metal and wood-working equipment installed. The present force of twenty-five men will be increased to at least forty.

The Manitowoc Plating Works, Manitowoc, Wis., has awarded contracts for the erection of its new shop on Franklin Street, between Twenty-fourth and Twenty-fifth streets. It will be of reinforced concrete, brick and steel, 50 x 100 ft., two stories and basement. The company specializes in work for aluminum foundries. W. J. Wachowitz is manager.

The J. E. F. Spark Plug Co., Milwaukee, has awarded the building contract to the Cutter Construction Co., 886 Forty-sixth Street, for the construction of its new automobile ignition specialty plant at Thirty-seventh Street and Hillside Lane. The building will be 50 x 160 ft., one story, of reinforced concrete, steel and brick, and will cost $17,500 without equipment. F. A. Ramstack is president.

Cleveland

CLEVELAND, March 10.

The automobile industry continues to furnish a good volume of business. A local machinery house the past week booked orders from Michigan aggregating $175,000, mostly for small lots. The demand for automatic machines has improved and a local builder has just booked an order for four of these machines also for shipment to Michigan, and is quoting on three other inquiries aggregating 70 machines.

The market in this section is rather quiet. Second-hand machinery is moving well at prices regarded as attractive for the buyer. A great deal of machinery used for war purposes is going on the market at about 50 per cent of pre-war prices. Prices are still attracting a great deal of attention, and while there are no reports of formal reduction, the belief seems more prevalent that some manufacturers will reduce prices April 1. Many machine tool builders are still guaranteeing prices 4 to 6 months. On the other hand, reports of price cutting are quite numerous, particularly in punch presses, for which competition appears to be keen.

Manufacturers of screw machine products report a marked increase in the volume of orders, but a great deal of this business is going at low prices. The manufacturing capacity for this class of work was greatly increased during the war, and some plants that were equipped with automatics for war work are now eager for business.

The Pierce Planting Corporation, New York, has acquired from the K. D. Carburetor Co. 8000 sq. ft. of floor space in a factory at Marquette Street and Hamilton Avenue, Cleveland, and will equip it for nickel plating. J. N. Pierce is president and E. Ekedahl secretary and treasurer. The offices will be in Cleveland.

The U. S. Copper Products Co., which is building a new plant in Cleveland, has placed an order with the General Electric Co. for a brass melting furnace of the muffled arc type with a capacity of 2200 lbs. per hr.

The Blomquist-Eck Machine Co., Cleveland, has increased its capital stock from $150,000 to $200,000.

The Home Specialty Co., Cleveland, manufacturer of electric washing machines, will build a new plant on East 152nd Street, 80 x 100 ft., two stories.

The Sterling Spring Co., Scranton Road, Cleveland, will erect an addition 100 x 150 ft.

The Colonial Foundry Co., Louisville, Ohio, recently incorporated with a capital stock of $65,000 to take over the foundry of the Bonnot Co., has elected Clarence M. Converse, formerly with the Novelty Iron Co., Canton, president; T. A. Jackson, formerly superintendent of the Columbiana Pump Co., Columbiana, Ohio, treasurer; and Harry Connor, formerly superintendent of the Penn Mold & Foundry Co., Dover, Ohio, secretary.

The Erie Tire & Rubber Co. has acquired the plant in Sandusky, Ohio, recently occupied by the Eagle-Macomber Co., and will equip it for the manufacture of automobile tires. A new boiler house will be erected and a second unit, 100 x 300 ft., three stories, is proposed. C. H. Berlekamp is president, and C. H. Roth, secretary.

The Advance Foundry Co., Dayton, Ohio, has moved from Crane and Harshman avenues to Parnell and Florence avenues.

Detroit

DETROIT, March 10.

The removal of the obstacles in settlement of informal war contract claims by the Government has had a steadying influence upon business, and is reflected through increased orders for machinery and tools. Local plants are rapidly resuming normal operations, and practically all surplus labor is being absorbed.

The machinery trade is optimistic as to the business outlook. Orders and inquiries have been steadily increasing for over a month, and the nature of these indicates that a large number of Michigan manufacturers are rapidly resuming production without waiting for further price reductions. It is believed that if there are to be any reductions they will come very slowly, probably extending over a year or more, owing to the fact that labor, living costs and materials must alternate in small price reductions.

The movement to place Government-owned machinery and tools in trade and technical schools is heartily favored by the local trade. It will place much of the machinery, particularly special machinery and tools, where it will do considerable good, and at the same time enable manufacturers to clear away more quickly for their new work.

There is an increasing demand for tractor manufacturing tools. The airplane industry is also being built up on a commercial basis. The Packard Motor Car Co. has placed an airplane on the market and several other manufacturers are rapidly completing plans for similar departments.

The Saginaw Shipbuilding Co., Saginaw, Mich., recently voted an increase in capital stock from $500,000 to $750,000. When the plant was originally constructed it was contemplated to execute a contract for six ships only. Subsequently, at the request of the Government, the contract was increased to 24, necessitating further expansion.

The Wilson Foundry & Machine Co., Pontiac, Mich., is erecting an addition to its plant, 100 x 800 ft.

Although the Commerce Motor Car Co., Detroit, made quite an addition to its plant to take care of war work, architects are again working on another extension to the factory.

At the annual meeting of the Blood Brothers Machine Co., Allegan, Mich., the following directors were elected: L. H. Mattingly, O. S. Crose, F. J. Chichester, C. E. Carson and L. L. Thompson. L. H. Mattingly, T. F. Updyke and R. G. Urch were elected directors of the Allegan Steel Process Co.

The American Blower Co., Detroit, has purchased 28 acres on the Detroit Terminal Railroad, north of Grinnell Avenue, near Gratiot Avenue and French Road, valued at $125,000, and it is reported contemplates the construction of a $750,000 plant to house the business which is now conducted at 1400 Russell Street. It is expected that the company will retail its present plant on Russell Street. It also operates a foundry on Orleans Street and branch factories in Windsor, Ont., and Troy, N. Y.

Expansion of its business to include specialties manufacture, the use of 10,000 sq. ft. of floor space and the employment of more than 50 men is planned by the Barker-Fowler Electric Co., Lansing, Mich. The company manufactures motor and elevator enclosures.

The Western Carburetor Co., Alma, Mich., capitalized at $120,000, will resume operations within a few weeks. The company is being reorganized under the direction of J. L. Eggleston, Champaign, Ill., while Henry Prescott, Indianapolis, Ind., will be sales manager and superintendent.

An expenditure of $1,000,000 for new machinery and manufacturing facilities has been authorized by the directors of the Hudson Motor Car Co., Detroit. The new Essex car branch will make use of the plant built for the manufacture of shells.

The Charles Bohn Foundry Co., Hart Avenue, Detroit, Mich., is taking bids for the erection of its proposed one-story foundry, 168 x 240 ft., on Chene Street.

The General Motors Corporation, Detroit, is said to have arranged an appropriation of $1,500,000 for extensions to the plant of the Scripps-Booth Co. division, Beaufort Avenue.

The Olds Motor Works, Division of the General Motors Corporation, Lansing, Mich., is operating its plant on a complete pre-war basis, and has arranged for the manufacture of the Oldsmobile Economy motor truck.

St. Louis

ST. LOUIS, March 10.

The Bristow Compress Co., Bristow, Okla., has been organized with $50,000 capital by C. F. Moore, W. B. Goudelock and others, and will receive bids for machinery for the establishment of a plant.

The Maryville Electric Light & Power Co., Maryville, Mo., G. C. Hellmers, superintendent, will enlarge its plant and add considerable machinery to extend its service.

The city of Macon, William H. Martin, city clerk, will expend about $125,000 on an electric power and light generating plant. Frank Wilcox, St. Louis, is engineer in charge.

The town of Perry, Okla., will expend about $100,000 extending its electric light and waterworks plants.

The Bridge & Beach Mfg. Co., St. Louis, is having plans prepared for a new foundry in connection with its plant.

The Monarch Machine Co., Tulsa, Okla., T. O. Kerr, Charles O. Fitzgerald and others interested, is reported in the market for about $10,000 worth of machinery.

The Thomas Oil & Refining Co., Oklahoma City, Okla., H. G. Murphy, J. P. Taneyhill and others interested, is reported in the market for about $20,000 worth of equipment.

Armour & Co., Chicago, Ill., will equip a $75,000 packing and refrigerating plant at Springfield, Mo.

The Port Commissioners, New Orleans, La., have authorized a bond issue of $8,000,000 to complete the New Orleans industrial canal, equip it with loading machinery and install other mechanical apparatus.

The Auto Spring Mfg. Co., Mousley & Munz, owners, Kansas City, Mo., will equip a plant for the manufacture of automobile springs.

The Board of City Trustees, Selma, Ala., is considering plans for the establishment of a municipal electric-lighting plant.

The National Grate Bar Co., Birmingham, Ala., has been incorporated with a capital of $10,000 by W. L. Rosamond, H. C. McCormack and R. D. Curry, to manufacture grate bars and similar specialties.

The Harbison-Walker Refractories Co., Pittsburgh, is planning for a one-story addition to its plant at Fairfield, Ala. It is reported that the company contemplates an expenditure in excess of $500,000 for the total expansion.

The Franklin Auto & Supply Co., Franklin, Tenn., has been incorporated with a capital of $50,000 by J. W. Jewell, J. T. Craig and Waco Webb, to manufacture auto parts, etc.

Indianapolis

INDIANAPOLIS, March 10.

The Evans Truck & Axle Co., Auburn, Ind., recently incorporated with a capital stock of $500,000, has purchased the building formerly occupied by the Zimmerman Mfg. Co., Auburn. Additional equipment will be installed for the manufacture of motor trucks. R. H. Evans, Fort Wayne, Ind., is president.

It is announced that a fifth story will be added to the factory now being constructed at the Remy electric plant of the General Motors Corporation, Andersonville, Ind., making a total floor space of 108,000 sq. ft. The number of employees at this plant is 2700.

The Anderson Foundry & Machine Co., Anderson, Ind., recently reorganized with a capital of $1,200,000, has elected the following officers: W. N. Durbin, president; W. Sayre, Dayton, Ohio, vice-president; N. M. McCullough, treasurer, and D. H. Durbin, secretary.

The General Motor Truck Co., Indianapolis, has been incorporated with a capital of $10,000 by William H. and F. Pye, and L. E. Peck, to manufacture motor truck parts.

The property of the Stenotype Co., Indianapolis, manufacturer of the stenotype machine, will be sold by the receiver March 18. The equipment includes machine tools, electrical equipment, blowers, furnaces, and miscellaneous apparatus. The building and site, consisting of a main structure, with two three-story wings, two one-story assembling shops and other structures, on 10 acres of land, will be sold later with patents, etc. The plant, exclusive of machinery and equipment, cost about $125,000. The Fletcher Savings & Trust Co. is receiver.

The Rapid Rim Co., Huntington, Ind., has been organized and has bought property and will equip a plant to make rapid demountable rims, detachable head pistons and leak-proof rims.

The Burdick Tire & Rubber Co. is erecting factory buildings at Noblesville, Ind. One building is complete and four others are to be constructed during the spring and summer.

The Lawson Casket Co., Newcastle, Ind., recently organized, has bought the factory buildings formerly used by the Allen Pitless Scale Co. and will equip them for manufacturing.

The foundry department of the Union Sanitary Mfg. Co., Noblesville, Ind., which has been closed since last November, has resumed operations.

The Super Tread Tire Co., South Bend, Ind., has increased its capital stock from $5,000 to $100,000.

The Automatic Dump Car Co., South Bend, Ind., has increased its common stock from $75,000 to $500,000 and has retired $25,000 preferred stock.

The Van Briggle Motor Device Co., Indianapolis, has increased its capital stock from $300,000 to $500,000.

Cincinnati

CINCINNATI, March 10.

Some improvement is noted in domestic inquiry for machine tools, and there is also a slight increase in the number of orders received. The call for milling machines is good. Second-hand machinery dealers have considerable business under negotiation but claim customers are slow in buying. The comparatively small number of second-hand machines on the market is a matter that excites a great deal of interest, and in some circles it is stated that the number of standard machines owned by the Government will run much lower than the general public has been led to believe.

A large number of portable electric drilling and grinding machines have recently been sold for shipment to Japan, and some machine tool orders have also been received from that source. Spain bids fair to become a good customer, if the inquiries in hand indicate anything. The exorbitant freight rates have been a handicap in doing business with that country. A few orders have also been received lately from both France and England, and it is now stated that the embargo on shipments to the latter country is not as strict as was first feared.

The number of unemployed skilled mechanics is very small and the total of unskilled men out of work is said to have been over-estimated, as far as local conditions are con-

cerned. At Dayton, Ohio, the situation is somewhat different, but many of the war workers there are returning to the country.

The Southern Motor Co., Memphis, Tenn., is inquiring in this market for a second-hand, motor-driven 16 or 18-in. lathe with an 8 or 10 ft. bed.

The Englert Engineering Co., Nashville, Tenn., is asking in this market for a second-hand 36 or 40-in. lathe.

The Nashua Gummed & Coated Paper Co., Middletown, Ohio, will build an addition to its plant that will give it 12,000 sq. ft. more floor space.

The Quil-Way Fixture Co., Dayton, Ohio, J. D. DeWeese, president, has been incorporated with $25,000 capital stock and will equip a plant for the manufacture of store fixtures.

The Springfield Metallic Casket Co., Springfield, Ohio, has let contract for an addition to its plant, 60 x 65 ft., five stories, of brick, steel and concrete.

The Westcott Motor Co., Springfield, has increased its capital stock from $500,000 to $750,000. Nothing is known as to the company's plans for enlarging the capacity of its plant.

The Monitor Motor Car Co., Columbus, Ohio, has increased its capital stock and intends to erect a new factory at an early date.

The Seybold Machine Co., Dayton, maker of paper machinery, has purchased the plant of the Oswego Machine Works, Oswego, N. Y., and will remove the equipment to Dayton.

The Hayden Corbett Chain Co., with plants at Columbus, Ohio, and Huntington, W. Va., has merged with the National Engine Co., Marietta, Ohio, and the James MacKay Co., Pittsburgh. It is reported that the plant at Columbus will be enlarged at an early date.

The Safe Cabinet Co., Marietta, Ohio, has increased its capital stock to $2,000,000. The company expects to expand its business but has yet made no announcement as to any factory extensions.

The Wellston Foundry Co., Wellston, Ohio, which acquired the former plant of the Eclipse Foundry Co., is making repairs and will put it in operation at an early date.

Canada

TORONTO, March 10.

There is a fair amount of business in machine tools with a good demand for metal and wood-working machinery. Estimates have been submitted quite freely on the list of 27 tools issued about three weeks ago by the Canadian National Railways, Toronto. With the present anxiety on the part of dealers to keep things going it is expected that some pretty close prices will be submitted. Frequent sales are being made to smaller concerns and the outlook for orders from war plants is beginning to take on a brighter aspect. There was a feeling a few weeks ago that the market was in danger of being swamped with used machinery from shell plants. The most desirable of this is being absorbed without upsetting the market, while large quantities have gone to scrap dealers.

The Gray Mfg. & Machine Co., Ltd., 686 St. Clarens Avenue, Toronto, has for disposal about $5,000 worth of machinery for which it has no further use, and is in the market for one power press, equal to No. 220 Brown Boggs or No. 6 Consolidated, with 3 to 6 in. stroke; one positive pressure blower, 2-lb. pressure, equal to No. 30 Connersville. The company is also adding the manufacture of ball bearings, heavy stamping and automobile parts to its industry, and will soon have them on the market. The company is being reorganized and has increased its capital stock to $150,000 to take care of the changes and will shortly change its name to the Gray Ball Bearing & Mfg. Co., Ltd. Alex. Gray is president; John Reekie will have charge of the sales department and W. J. McCallum will be chief engineer and works manager. Both Mr. Reekie and Mr. McCallum have for some years been connected with the Chapman Double Ball Bearing Co., Toronto.

The Grand Trunk Railway, Montreal, will build repair shops at Victoriaville, Que., to cost about $60,000. W. R. Graham, Montreal, is general superintendent.

The Hydro-Electric Power Commission of Ontario, University Avenue, Toronto, will build a planing mill at Cobourg, Ont., to cost about $60,000.

The plant of the Dominion Glass Co., Ltd., Montreal, was damaged by fire March 5 with a loss, chiefly to the machinery, estimated at $100,000. It is expected that the plant will be repaired immediately and new machinery purchased.

The Romeo Foundry Co., Port Huron, Mich., plans the erection of a foundry at Sarnia, Ont., to cost about $150,000. L. G. Blunt is manager.

Frank R. Keefe, Burns Lake, B. C., plans the erection of a sawmill and dam at Stellaco River costing $50,000, and is asking for prices on machinery and equipment.

The London Mfg. & Machine Co.'s plant has been taken over by Beatty Brothers, London, Ont. It was formerly operated as a munition works, but will be turned into a factory for the manufacture of pumps.

At the annual meeting of the Canada Foundries & Forgings, Ltd., Brockville, Ont., the following officers were elected: President, W. M. Wier, Montreal; vice-president, J. Gill Gardner, Brockville; secretary treasurer, J. H. A. Briggs, Brockville. The directors are T. J. Dillon, Welland; Hon. G. P. Graham, Brockville; Lieut.-Col. Monsarratt, Ottawa; H. Howser, Toronto; H. Bertram, Dundas, Ont., and Hon W. J. Shaughnessy, Montreal.

At a meeting of the directors of the International Malleable Iron Co., Guelph, Ont., it was decided to proceed at once with the erection of a new factory, three stories, 60 x 160 ft., in addition to its present plant. The new building will be used for the manufacture of pipe fittings and will provide initial employment for at least 100 men. Construction will begin as soon as plans are completed and contracts let.

The Lang Machinery Co. has leased the factory on Suffolk Street, Guelph, Ont., formerly occupied by Libby, McNeal & Libby. It is capitalized at $100,000.

San Francisco

SAN FRANCISCO, March 4.

Labor conditions have upset the machinery market which gave promise of being excellent before the situation became acute. Some dealers now claim that conditions will not become normal until after peace is signed in Europe. Waiting seems to have been adopted as a watchword for many.

The American Brake Shoe & Foundry Co., New York and Chicago, is preparing to establish a branch foundry in South San Francisco and has been negotiating for the purchase of the South San Francisco branch plant of the Enterprise Foundry for a reported consideration of $250,000.

It is reported that the Moore Shipbuilding Co., Oakland, has under contemplation the immediate expansion of its plant at a cost of $1,250,000.

It is announced that revised plans for a $1,500,000 structural shop building for the Mare Island Navy Yard have been approved and bids called for to be submitted by March 10.

The Union Construction Co., San Francisco, is erecting a two story addition to its plate shop at its Oakland shipbuilding plant at a cost of $12,000.

Arthur Bradt and Ernest Clotter, Chico, Cal., are installing a drill press, latnes and other machinery in a new machine shop they have erected.

It is reported that the Santa Fe Railroad will spend about $650,000 enlarging its machine shops at Albuquerque and $100,000 for new equipment.

The Pacific Northwest

SEATTLE, March 4.

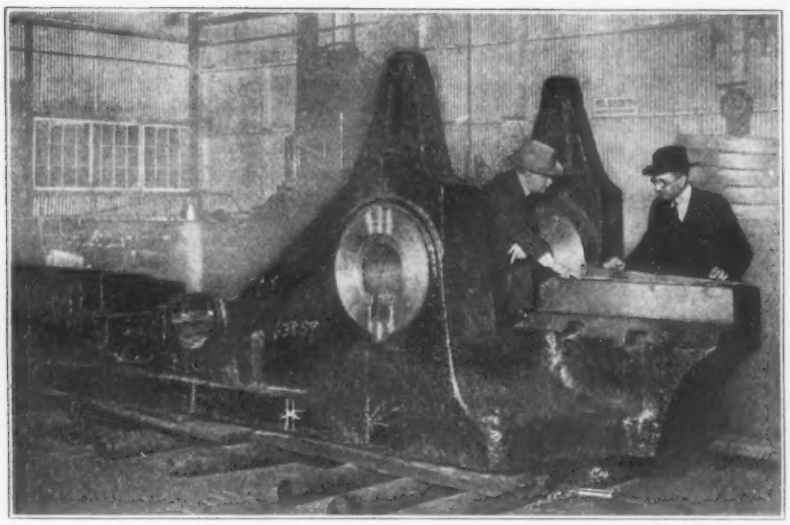
At a recent meeeting of Tacoma and Seattle metal trades councils a conditions agreement was reached to submit the question of calling off the shipyard strike to a referendum vote of employees. It is expected if this vote is taken, that the men will return to work.

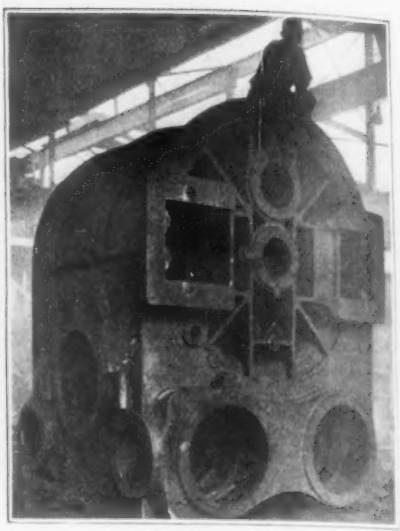
The recent order of the Emergency Fleet Corporation in regard to machinery installation in wooden vessels under construction has affected 14 wooden hulls in local shipyards. With these all completed a lull of five or six months is expected, during which the plants will either be closed or operating with only a few men. At the end of that time it is believed the yards will reopen with new contracts. It is predicted that with a better mastery of the internal combustion oil engine, there will be a revival in the construction of motor ships and auxiliary power sailing vessels.

The lumber industry is active with new business developing in considerable volume.

The Lead Trust Mining Co., near Spokane, Wash., will install new machinery in the spring, including a 60-hp. boiler, 25-hp. engine and compressor. The equipment will cost about $5,000.

The Aberdeen Cabinet Works, Aberdeen, Wash., has purchased a site in that city on which a sash and door plant will be built.





The Largest Casting So Far Produced on the Pacific Coast—a 58,000-lb. Base for an Alligator Shear—Under Inspection by H. S. Hitchcock (left), Treasurer Baker Iron Works, and A. C. Denman (right), President and General Manager Southern California Iron & Steel Co. View at right is of a 3500-hp. marine engine cylinder cast at the plant

Expansion of Baker Iron Works in Keeping With Rapid Growth of Los Angeles

THE close interrelation between a live community and an efficient industrial organization growing up in its midst could hardly find a better illustration than in the case of the city of Los Angeles, Cal., and the Baker Iron Works. In 1872, when the works was started, the needs of the inhabitants were mostly agricultural and the plant made plows and farm implements and ran a jobbing foundry and machine shop. With a rapid increase in the population came the need of improved means of local transportation, and the company enlarged its facilities to make street cars, employing a force of about 100 men.

Then came the oil boom and its urgent and pressing demand for the highly specialized tools and equipment for well drilling. Eleven steam hammers were added to the equipment giving constant employment to 300 men. The works escaped the dangers of over-specialization, as the panic of 1907 put a quietus on further activity in the development of Southern California oil resources, but did not arrest the progress of California nor interrupt the rebuilding of San Francisco.

In the reconstruction the reinforced concrete office building found extensive application, and in their operation high-speed elevators were essential. Utilizing its experience gained as agent of the Otis Elevator Co., the Baker Iron Works not only furnished and equipped complete but for the electric motors, high power passenger and freight elevators but undertook also the fabrication and erection of the steel frames for this type of building construction.

It also designed and fabricated a special riveted steel pipe 7 ft. in diameter with 1-in. walls, used extensively in the new 260-mile Los Angeles aqueduct, and in irrigation work, running all the way from 10 gage (9/64 in.) to 16 gage (1/16 in.).

In the four years preceding the war the company completed and installed 50 overhead travelling cranes in Southern California and South America, the largest of which, now in the plant of the Southern California Iron & Steel Co., Los Angeles, is operating with five motors over a span of 60 ft. with a lifting capacity of 50 tons.

Its boiler shop meantime was turning out equipment for sugar works and chemical plants. A problem of peculiar local importance successfully solved was the design and installation of apparatus for the production of gas from crude oil by distillation. This product, mixed with coal gas, is extensively used for lighting and heating purposes and means a great saving to the consumer through elimination of transportation charges on coal and coke from distant centers of production.

The city, through the development of San Pedro harbor and by connecting it with the city through the acquisition of the so-called "Shoe-string" strip, more lately consolidated its position as an important factor in the Pacific marine trade. This growth was brought to rapid maturity by the outbreak of the war.

To meet shipbuilding demands a gray iron foundry was installed, with facilities for producing the large castings required for marine construction (between 15 and 22 tons) at the rate of up to 75 tons per day. A notable performance in its machine shop department has been the finishing of what is reported to be the heaviest so far cast on the Pacific Coast. It was poured at the Columbia Steel Co., Pittsburg, Cal., and forms the base of an alligator shear. The preparation of the local scrap for open-hearth operation exposes such tools, designed for cutting 6 x 6 in. bars in the cold, to exceptional strains which the original cast-iron base of the machine was found incapable of withstanding. The new casting measures 25 ft. long x 8 ft. wide x 8 ft. high at the highest point. It weighs about 58,000 lb., and the cutting blade, which will be electrically operated, will weigh over 10 tons.

Manufacture of Carbon Electrodes

The pioneer work in the manufacture of carbon electrodes was done by a Frenchman, Carré, about 1876. At that time, however, the principal demand was for use in electric arc lights. The chief raw materials used are: Coke, charcoal, anthracite, lamp black, retort carbon, tar coke, petroleum coke and graphite. In some cases extensive equipment is required for graded crushing, grinding and screening. After crushing the material is mixed with the binding medium, usually tar or pitch, and then kneaded or mixed in steam-jacketed mixers. Before mixing, however, the raw materials are subjected to calcination to remove gases and oily substances. The material is then pressed, sometimes in extremely powerful presses (according to the size of the electrode), to the form required. Roasting and coking processes are then applied to the pressed pieces in tunnel kilns or in Mendheim furnaces. The pieces in tunnel kilns are of very great length. The electrodes are placed into square or round chambers and packed with carbon dust to exclude the air during baking which lasts from six to 12 days for smaller pieces and from 10 to 16 days for larger ones. During the early part of baking the tar oils in the binding medium distill off, following this the binding medium cokes and the entire mass slags. Great care must be employed in heating the electrodes uniformly in order to avoid undue stresses. The following values for the physical and chemical qualities of amorphous carbon electrodes are from a German source:

Specific weight	1.50–1.55
Specific resistance at cross-sections of from 25 to 3000 sq. cm. in ohms	45 to 100
Electrical coefficient of temperature of from 25 to 900 deg. C.	0.000215
Specific heat at 100 deg. C.	0.18–0.22
Compressive strength, kg. per sq. cm.	230–410
Bending strength, kg. per sq. cm.	51–81
Heat extension from 0–700 deg. C., per cent of the initial value	0.26
Heat conductivity for a cube of 1 cu. cm. at temperature falls from 130–20 deg. C. in heat units per hr.	0.24
Ash content, per cent	2.5–3.0
Phosphorus, per cent	0.45–0.53
Sulphur, per cent	0.81–1.10

M. C. Fairchild & Co., Inc., exporters of railroad supplies, announce that they have opened offices in the Equitable Trust Co. Building, 347 Madison Avenue, New York. Maurice C. Fairchild is president and Joseph F. O'Boyle is secretary and treasurer.

NEW TRADE PUBLICATIONS

Sugar Factory and Refinery Equipment.—Ingersoll-Rand Co., 11 Broadway, New York. Catalog. Covers a wide range of vacuum pumps, both steam and fire driven; counter-current barometric condensers, for use in conjunction with multiple effects, evaporators and vacuum pans, as well as for steam condensing; Cameron centrifugal and reciprocating pumps; steam and power driven air compressors; and a line of pneumatic tools. The various machines are illustrated but are touched upon briefly as they are covered in detail in individual bulletins.

Pivoted Bucket Conveyer.—Jeffrey Mfg. Co., Columbus, Ohio. Catalog 210, size 4½ x 7 in., pages 98, cloth cover. Describes the company's latest type of pivoted bucket conveyer for the handling of coal, ashes, clinker, etc. Details of the carrier are illustrated and explained and interesting interior views of large power plant equipments are shown. Reproductions of interest to architects as well as the engineer, of diminished blue prints in actual color, typical for the various sizes of carrier equipment, are included.

Power Presses.—Sidney Power Press Co., Sidney, Ohio. Catalog. Concerned with a line of open back inclinable presses made in capacities of 5, 10, 15 and 25 tons. All presses are furnished equipped with an automatic safety guard. Halftones of the presses are shown.

Automatic Bar Machine.—New Britain Machine Co., New Britain, Conn. Catalog. Illustrates and describes an automatic bar machine, designed to feed, drill, face, chamfer and cut off in six spindle positions simultaneously. Views of work for which the machine is adapted are shown. The illustrations are in tint.

Ball and Roller Bearings.—Gwilliam Co., 253 West Fifty-eighth Street, New York. Catalog. Lists and illustrates the company's line of ball and thrust bearings, steel annular ball bearings and steel balls.

Wood Milling Machines.—Oliver Machinery Co., Grand Rapids, Mich. Booklet 17. Describes the company's No. 102 universal wood milling machine for pattern and core box work, grooving, trenching, jointing, routing, surface work, gear cutting and general pattern work. Views of the machine operating on different classes of work together with views of various patterns that show the wide range of work that can be produced, are included.

Couplings.—Uniflex Coupling Co., 246 Chestnut Street, Philadelphia. Folder. Describes a coupling made up of jawed hubs which engage each other through a set of blocks. Long life and flexibility are claimed.

Electric Drills.—Independent Pneumatic Tool Co., Chicago. Circular 29. Concerned with a line of portable electric drills and grinders, operating on alternating or direct current at 110 or 220 volts. Different types are illustrated.

Water Tube Boilers.—Heine Safety Boiler Co., St. Louis. Catalog. An illustrated 86-page treatise on steam boilers, called "Boiler Logic." The chapter headings include some fundamental considerations of boiler design; practical baffled water tube boilers; boilers for different fuels, firing and services; overloads; the boiler as a pressure vessel; details of construction.

Locomotive Cranes.—Edward F. Terry Mfg. Co., New York. Bulletin 2. Describes the company's type F locomotive crane of 20 to 30 tons capacity. The various parts are described in detail, line cuts assisting in an understanding of the mechanism.

Feed Pump.—Coppus Engineering & Equipment Co., Worcester, Mass. Catalog. Description with illustrations of the company's type CCC centrifugal boiler feed pump. The pump is a complete unit in itself having one shaft common to pump and steam turbine. They are made in four sizes ranging in capacity from 100 to 3500 bhp.

Industrial Furnace Stokers.—Combustion Engineering Corporation, New York. Bulletin H-1. Covers automatic stokers for all kinds of industrial and heat treatment furnaces. A number of views showing the construction and operation of the stokers and applications to industrial furnaces are shown.

Clam Shell Buckets.—Lakewood Engineering Co., Cleveland. Bulletin 26. Deals with all kinds of clam shell buckets for digging. Numerous views of the buckets, some in operation, are given.

Plate Casters.—Edward F. Terry Mfg. Co., Grand Central Terminal, New York. Bulletin 1. Describes a plate casting bed, an arrangement of swivel wheels suitably spaced and mounted on posts for the storage and handling of plates. The standard arrangement consists of cast iron floor plates, 5 ft. square with posts 20 in. apart in both directions. The wheels and castors are equipped with roller and ball thrust bearings of heavy design.

Steel Sheet Piling.—Walter A. Zelnicker Supply Co., 325 Locust Street, St. Louis. Catalog 260. Lists a stock of steel sheet piling and second-hand pipe.

Ingot and Babbitt Metals.—Ajax Metal Co., Philadelphia. Two booklets. One called "A Text Book on Ingot Metals," describes the company's process in making ingots, and offers suggestions for the proper use of ingot metals. The second booklet, "A Text Book on Babbitt Metals," gives explanations of why one Babbitt is better than another for some particular purpose.

Manufacture of Belting.—Chas. A. Schieren Co., 30-38 Ferry Street, New York. A booklet with the title "The Story of Schieren Beltings." Illustrates and describes the various steps in tanning and manufacturing leather belting so that laymen will get some conception of the extreme care, skill and time required to transform the raw hides into an efficient means for transmitting power safely and continuously. There are 12 illustrations in colors. A price list booklet, issued by the same company, differentiates the various brands of beltings not only by name and marking but also by grades and weights.

Chains for Drives.—Morse Chain Co., Ithaca, N. Y. Publication 16. A booklet with the title "Small Power Drives." Gives a description of the company's "silent chain drives" with numerous illustrations of chain in use on various machines, such as printing presses, mills, compresors, etc.

Office and Factory Supplies.—L. F. Grammes & Sons, Allentown, Pa. Catalog B18. Illustrates and describes the company's output of office and factory supplies, including such items as clips, fasteners, thumb tacks, number plates, escutcheon pins, marking sets, hinges, rivets, key rings, etc.

Derricks.—Insley Mfg. Co., Indianapolis. Bulletin 110. Describes in detail standard guy and stiffleg derricks. Views of parts of the mechanism as well as complete installations are shown.

Economizers.—Green Fuel Economizer Co., Beacon, N. Y. Catalog 8½ x 11 in., 63 pages. A summary of facts regarding the company's fuel economizer, its purpose, construction and applications. Numerous views of the economizer installed in customers' plants are included.

Trucks and Tractors.—Walker Vehicle Co., Chicago. Catalog 19. Points out the economy effects obtained by the use of the company's electric trucks and tractors for road use. Numerous views of machines built for customers are shown. A feature emphasized is the "balanced drive," composed of 10 parts, all rotating and balanced.

Wire Products.—Wickwire Steel Co., Buffalo. Catalog. Lists the company's products, including steel wire nails, barbed wire and staples. The various products are illustrated.

Lift Trucks.—Steubing Truck Co., Cincinnati. Catalog. Describes a lift truck for inside trucking, made in models of capacity from 3000 to 5000 lb., also special models, capacity 8000 to 14,000 lb. Illustrations show the application of the truck in various industries.

Reflectors.—Reynolds Electric Co., Chicago. Bulletin 35. Pamphlet. Describes porcelain enameled reflectors designed for bulletins, poster boards, walls and signs.

Annealing and Heat-Treating Furnaces.—W. S. Rockwell Co., 50 Church Street, New York. Catalog No. 39. Concerned with rotary annealing and heat-treating furnaces using oil or gas fuel. A sectional view of the furnace and a number of plant installations are included.

Electric and Open Hearth Steels.—Peter A. Frasse & Co., 417-421 Canal Street, New York. Catalog, size 4½ x 7 in., 98 pages, cloth cover. Lists and describes a stock of electric and open hearth steels of various grades and qualities. Price lists and a number of useful tables are included.

Plumbers' and Waterworks Supplies.—John C. Kupferle Foundry Co., St. Louis. Catalog 24, size 7 x 10 in., 75 pages, cloth cover. Descriptions with illustrations of the company's line of supplies for plumbers and waterworks, including hydrants, street washers, self-closing hopper cocks, stop and waste valves, cesspools, floor drains, grates for sewer and soil pipes, cesspool grates, solder pots, air vents, etc.

Steel Lamp Guards.—Flexible Steel Lacing Co., 522 South Clinton Street, Chicago. Folder. Deals with an expanded steel, tin coated lamp guard. One style locks with a key, the other with a round head screw.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience

On a number of articles the base price only is giv it being impossible to name every size.

The wholesale prices at which large lots are sold manufacturers for direct shipment from mills a given in the market reports appearing in a preceding part of THE IRON AGE under the general headings "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	4.17c
Burden's H. B. & S. bar iron, base price	6.30c
Burden's best bar iron, base price	6.50c
Swedish bars, base price	20.00c
Soft Steel:	
¾ to 1⅞ in., round and square	3.97c
1 to 6 in. x ⅜ to 1 in.	3.97c
1 to 6 in. x ¼ and 5/16	4.07c
Rods—⅝ and 11/16	4.02c
Bands—1½ to 6 x 3/16 to No. 8	4.57c
Shapes:	
Beams and channels—3 to 15 in.	4.07c
Angles:	
3 in. x ¼ in. and larger	4.07c
3 in. x 3/16 and ⅛ in.	4.32c
1½ to 2½ in. x ⅛ in.	4.32c
1½ to 2¾ in. x 3/16 in. and thicker	4.07c
1 to 1¼ in. x 3/16 in.	4.12c
1 to 1¼ in. x ⅛ in.	4.17c
⅞ x ⅞ x ⅛ in.	4.22c
¾ x ⅛ in.	4.27c
⅝ x ⅛ in.	5.07c
½ x 3/32 in.	5.77c
Tees:	
1 x ⅛ in.	4.47c
1¼ in. x 1¼ in. x 3/16 in.	4.37c
1½ to 2½ x ¼ in.	4.17c
1½ to 2½ x 3/16 in.	4.17c
3 in. and larger	4.12c

Merchant Steel

	Per lb.
Bessemer machinery	3.97c
Tire, 1½ x ½ in. and larger	3.97c
Toe calk, ½ x ⅜ in. and larger	4.72c
Open-hearth spring steel	8.00c
Standard cast steel, base price	16.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

	Per lb.
¼ in. and heavier	4.27c

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in.	5.12c
No. 10	5.17c
No. 12	5.22c
No. 14	5.27c
No. 16	5.37c

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	6.02c	——
Nos. 22 and 24	6.07c	7.62c
No. 26	6.12c	7.67c
No. 27	6.17c	——
No. 28	6.22c	7.82c
No. 29	6.32c	——
No. 30	6.42c	——

No. 28, 36 in. wide, 10c higher.

Genuine Russia, as per assortment ..... 22½ @ 25c

Woods Keystone Hammered, 18-24 gage, 10c.; 26-28 gage, 11c.

Galvanized

	Per lb.
No. 14	6.67c
No. 16	6.82c
Nos. 18 and 20	6.97c
Nos. 22 and 24	7.12c
No. 26	7.27c
No. 27	7.42c
No. 28	7.57c
No. 30	8.07c

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER

Bright basic	5.50c
Annealed soft	5.50c
Galvanized annealed	6.25c
Coppered basic	6.25c
Tinned soft bessemer	7.50c

*Regular extras for lighter gages.

Brass Tubes, Rods and Wire, and Copper Tubes

Manufacturers have withdrawn all quotations because of unsettled prices of raw materials and will only name prices to actual buyers.

Copper Sheets

Sheet copper, hot rolled, 16 oz., 23½c. to 25½c. per lb.

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Polished, 20 in. wide and under, 1c. per sq. ft. extra over 20 in. wide, 2c. per sq. ft. extra.

Planished copper, 1c. per sq. ft. more than polished.

Tinning, one side, 6c. per sq. ft.

Tin Plates

Bright Tin		Coke—14x20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Primes	Wasters
			80 lb.	$8.70	$8.45
			90 lb.	8.80	8.55
			100 lb.	8.90	8.65
IC	$11.65	$10.40	IC	9.15	8.90
IX	13.85	12.35	IX	10.30	10.05
IXX	15.60	14.10	IXX	11.45	11.20
IXXX	17.35	15.85	IXXX	12.60	12.35
IXXXX	19.10	17.60	IXXXX	13.75	13.50

Terne Plates

8-Lb. Coating 14x20

100 lb.	$8.80
IC	9.00
IX	10.00

Tin

Straits pig	74c to 75c
Bar	85c to 90c

Copper

Lake Ingot	18c to 20c
Electrolytic	18c to 20c
Casting	18c to 20c

Spelter and Sheet Zinc

Western spelter	10c to 11c
Sheet zinc, No. 9 base, casks	12c; open 13c

Lead and Solder*

American pig lead	6½ to 7c
Bar lead	7½c to 8½c
Solder ½ & ½ guaranteed	46c
No. 1 solder	41c
Refined solder	35c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	90c
Commercial grade, per lb	50c

Antimony

Asiatic	10c to 11c

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting (carload lots), f.o.b. mill, per lb	33.10c
In small lots	38c to 40c

Old Metals

There is little change in the general situation. Prices are lower and business quiet. Dealers' buying prices are nominally as follows:

	Cents Per lb
Copper, heavy and crucible	13.00
Copper, heavy and wire	12.00
Copper, light and bottoms	10.50
Brass, heavy	7.50
Brass, light	6.00
Heavy machine composition	12.50
No. 1 yellow rod brass turnings	7.00
No. 1 red brass or composition turnings	10.00
Lead, heavy	4.25
Lead, tea	3.50
Zinc	4.50